

# Environmental Compliance SERVICES, INC.

IMMEDIATE RESPONSE ACTION AND
RESPONSE ACTION OUTCOME
505 FRONT STREET
CHICOPEE, MASSACHUSETTS
RTN#1-13691

100×100 97

# Prepared For:

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# EXECUTIVE SUMMARY

On behalf of T. Works, Incorporated, Environmental Compliance Services, Inc. (ECS) has completed an Immediate Response Action (IRA) Completion and Response Action Outcome (RAO) Report at the property located at 115 Wayside Avenue of West Springfield, Massachusetts. The Site is defined as the areas proximal to, and downgradient of the 10,000-gallon underground storage tank (UST) located in the northern portion of the property (referred to herein as "the Site"). The Site has been assigned Release Tracking Numbers (RTN) 1-1369 and 1-13747 by the Massachusetts Department of Environmental Protection (MADEP) due to concentrations of Extractable Petroleum Hydrocarbons (EPH) greater than Reportable Concentrations (RCs) and a failed tank tightness test. This investigation was conducted to satisfy the requirements of the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000.

A subsurface investigation was conducted throughout the Site as part of an Environmental Site Assessment in August of 2000. The subsurface investigation detected EPH in soil samples collected in the immediate vicinity of the 10,000-gallon diesel UST. The MADEP assigned the RTN of 1-13691 for this incident on December 8, 2000.

On November 20, 2000, a tank tightness test of the 10,000-gallon diesel UST was performed by Tanknology. The results of the test indicated that there was a likelihood of a leak associated with the in the inner wall of a double wall UST. This condition required notification to the MADEP within 72-hours. The MADEP assigned the RTN of 1-13747 for this incident on December 14, 2000.

From April 23 to April 25, 2001, IRA activities including the excavation of 428.28 tons of contaminated soil and collection of post excavation soil samples for field screening and laboratory analysis were performed. Groundwater samples were collected from groundwater monitoring wells and a Site survey was performed during this period.

Post excavation soil samples were submitted for laboratory analysis of Volatile Petroleum Hydrocarbons (VPH) and EPH. VPH C<sub>5</sub>-C<sub>8</sub> aliphatics, C<sub>9</sub>-C<sub>12</sub> aliphatics and C<sub>9</sub>-C<sub>10</sub> aromatics were detected in post excavation soil samples S-23 and S-32 at concentrations less than Method 1 Standards. VPH target analytes naphthalene and total xylenes were detected at concentrations less than Method 1 Standards. EPH C<sub>9</sub>-C<sub>18</sub> aliphatics, C<sub>19</sub>-C<sub>36</sub> aliphatics and C<sub>11</sub>-C<sub>22</sub> aromatics were detected in soil sample S-32 at concentration below Method 1 Standards. Targeted EPH analytes naphthalene, 2-methylnaphthalene, fluorene, phenanthrene and pyrene were also detected in soil samples collected from S-23 and S-32 at concentrations less than Method 1 Standards.

No EPH hydrocarbon ranges or targeted analytes were detected in groundwater samples collected from wells MW-2 and MW-3. Monitoring wells MW-1 and MW-4 could not be located. Chlorinated solvents including tetrachloroethene (PCE), trichloroethene (TCE) and cis-1,2-dichloroethene were detected in groundwater samples collected from well MW-2 at concentration less than RCs.

This RAO addresses the release of diesel fuel from the 10,000-gallon UST. No known source of chlorinated solvents was identified during the completion of this RAO. In addition a soil sample (S-40) collected from the northeastern corner of the excavation (along the property boundary with the City of West Springfield) was analyzed for VOCs. VOCs were not detected at concentrations greater than laboratory method detection limits.

In order to evaluate whether a level of No Significant Risk exists for foreseeable Site activities and uses, the MCP Method 1 Soil Standards S-1/2/3/GW-3 were used for characterizing risk associated with oil/hazardous material (OHM) detected at the Site.

Based on the assessment and remedial activities conducted at the Site, it was determined that no further remedial response actions are needed at the Site to achieve a condition of No Significant Risk. The Site qualifies for a Class A-2 RAO based on the following:

- Response actions have been conducted at the Site in order to achieve a level of No Significant Risk;
- Concentrations of VPH detected at the Site meet applicable Method 1 Risk Characterization Standards and do not exceed the Upper Concentration Limit (UCL) in soil.
- Background concentrations have not been achieved at the Site.
- This RAO ensures a level of control of each identified substance of concern at a Site or in the surrounding environment such that no such substance of concern shall present a significant risk of harm to health, safety, public welfare or the environment during any foreseeable period of time.
- No Activity and Use Limitation (AUL) is needed to maintain a level of No Significant Risk.

# 1.0 INTRODUCTION

On behalf of T. Works, Inc., Environmental Compliance Services, Inc. (ECS) has completed an Immediate Response Action (IRA) Completion and Response Action Outcome (RAO) Report for the property located at 115 Wayside Avenue in West Springfield, Massachusetts. The Site is defined as the areas proximal to, and downgradient of the former 10,000-gallon diesel underground storage tank (UST) located in the northern portion of the property (referred to herein as "the Site"). The Site location is shown in Figure 1, Site Locus. Figure 2, the Site Plan, shows the layout of the property. Figure 3 shows the excavation area and groundwater flow direction at the Site. Figure 4 shows a detail of the excavation area and sampling points. Figure 5 defines the area covered by this RAO. The Site is listed on the Massachusetts Department of Environmental Protection (MADEP) Standard Release Report list as Release Tracking Numbers (RTNs) 1-13691 and 1-13747.

# 2.0 SITE DESCRIPTION

#### 2.1 SITE LOCATION AND SETTING

The following information is provided as an overview of the Site location:

Site Address:

115 Wayside Avenue

Site Location:

West Springfield, Massachusetts

County:

Hampden

Latitude, Longitude:

42° 08' 38" North, 72° 37' 38" West

The Site property consists of approximately 2.13 acres of land and is improved with two buildings. The property and buildings are currently occupied by Trailer Works, Inc., a truck and trailer service company. The property was formerly used as an office, storage warehouse and service garage. A Site Plan illustrating Site features is provided as Figure 2.

The 10,000-gallon UST was formerly located in the northeastern portion of the property. Two 1,000-gallon (hydraulic and engine oil) UST are located in the northwestern corner of the property.

Abutting properties include: Capital Insulation to the west; West Springfield flood control property to the north; Bearings Specialty Company, Northeast Precision, A&M Compressed Air Products, Computerland and a residential house located to the south; and Town Way located to the east.

The Site property and abutting properties are serviced by municipal drinking water and sewer. Potential sensitive receptors include employees of the on and off-site buildings.

According to the information on the MADEP Bureau of Waste Site Cleanup (BWSC) Priority Resource Map of the Springfield North, published by the Massachusetts Geographic Information System (Mass GIS), the Site is not located within a MADEP approved Zone II, Interim Wellhead Protection Area (TWPA), and/or Potentially Productive Aquifer (PPA). The Site is not located within Habitat of Species of Special Concern or Threatened or Endangered Species. The Site is also not located within an area designated as State, Federal, Municipal non-profit Open Space and Recreational Facilities area or within 500 feet of an area mapped as Estimated Habitats for Endangered Wetland Wildlife according to the Natural Heritage & Endangered Species Program (NHESP).

#### 2.2 SITE HISTORY

According to available historical records, the Site was occupied by Capital Insulation in the 1970s and New England Roto Engraving in the 1960s and 1970s. The easterly portion of the Site along Town Way formerly supported Legers Rubbish Removal Corporation, a Division of Waste Management in the 1960s and 1970s. The Site had been occupied by Commercial Disposal since the mid 1980s until August 2000. In February 1996, United Waste purchased Commercial Disposal. In August 1997, USA Waste purchased United Waste. In July 1998, Waste Management purchased USA Waste. Waste Management is the parent company of Commercial Disposal. No on-site development was documented prior to the 1960s.

# 3.0 FIELD INVESTIGATIONS

#### 3.1 SUMMARY OF INVESTIGATIONS

# 3.1.1 - Environmental Site Assessment - 1994

An Environment Site Assessment was conducted at the Site in September of 1994. The assessment included background research, a review of state and federal environmental databases and files regarding the Site and surrounding properties; review of available documentation regarding closure of the Site as a Resource Conservation and Recovery Act (RCRA) Transport, Storage or Disposal Facility (TSDF) and groundwater sampling and analysis.

The site was formerly a Interim Status TSDF as defined by 310 CMR 30.00 RCRA. Storage of hazardous waste on the site was discontinued in 1987. The facility underwent a RCRA closure study performed by HRP Associates Inc. of Plainville Connecticut. Based on the study a closure certification and change of status form were filed by Commercial Disposal in July 1993. The closure study included the removal of above ground hazardous waste storage tanks and removal of soil from a hazardous waste drum storage area located in the eastern corner the site property. Groundwater monitoring wells were installed on the site and groundwater samples were obtained for quantitative analyses. Several chlorinated solvents were detected in groundwater on the site.

On January 25, 1994 a letter indicating that the closure satisfied the requirements of 310 CMR 30.587 was issued by the MADEP, Boston, Massachusetts. The letter indicated that no post closure requirements were imposed by the MADEP. Groundwater contamination, however, was detected on the site and the letter indicated that the groundwater contamination should be compared to the standards of the MCP 310 CMR 40.0000.

The property was a small quantity generator of waste oil. According to a May 24, 1993 Compliance Inspection of the property, a waste-oil space heater was permitted for use to burn up to 2,000-gallons of waste oil per year on the property. Approximately 1,650 gallons of waste oil were burner on the property for heating. The waste oil material was formerly stored in a 250-gallon above ground storage tank (AST). According to the file two parts cleaners were used on site and utilized naphtha for cleaning solvent. No floor drains or wastewater discharges were noted in the area of the waste-oil burner.

Emergency Response incident reports regarding the property indicate that approximately 30 gallons of diesel fuel was spilled at the property on December 1, 1992. The spill was cleaned by Oil Recovery of West Springfield, MA. The MADEP closed this case on December 4, 1992. On July 22, 1993, 20 to 50 gallons of hydraulic oil was released to the property from a hydraulic line on a dump truck. The file indicates that approximately 1.73 tons of absorbent material was used to cleanup this spill. Also, on October 21, 1994, approximately 3 gallons of fuel oil was spilled from an oil delivery truck and on April 30, 1986, approximately 5 gallons of diesel was spilled during an overfill of a storage tank. These spills were covered with absorbent and cleaned up by Commercial Disposal.

Groundwater samples were collected from five on-site and off-site groundwater wells as part of the 1994 report. The report also documents several sampling rounds that were conducted at the Site dating back to November 1989 (information obtained at the MADEP). Methyl tertiary-

butylether (MtBE) was detected in groundwater samples collected from well MW-3 at 3.2 microgram per liter ( $\mu$ g/L). Benzene and o-xylenes were detected in groundwater samples collected from well MW-2 at 3.3  $\mu$ g/L and 6.7  $\mu$ g/L.

Chlorinated solvents including 1,1,1-trichloroethane were detected at concentrations ranging from below detection limits (BDL) to 725 microgram per liter ( $\mu g/L$ )(MW-4 - 11/3/89), trans-1,2-dichloroethylene ranged from BDL to 65  $\mu g/L$  (MW-5 - 11/3/89), trichloroethene (TCE) ranged from BDL to 58  $\mu g/L$  (MW-5 - 10/23/90), tetrachloroethene (PCE) ranged from BDL to 78  $\mu g/L$  (MW-5 - 11/3/89), 1,1-dichloroethane ranged from BDL to 34  $\mu g/L$  (MW-4 - 11/3/89) and 1,1-dichloroethylene ranged from BDL to 13  $\mu g/L$  (MW-4 - 11/3/89). A copy of the Environmental Site Assessment is provided as Appendix A. A summary of analytical results is presented as Table 1 within the 1994 Environmental Site Assessment Report.

# 3.1.2 - Environmental Site Assessment - August 2000

An Environmental Site Assessment Report was prepared by ECS in August of 2000. As part of the investigation, nine soil borings (EP-1 through EP-9) were advanced throughout the property (Figure 2). Soil samples collected from each soil boring were field screened for Total Organic Vapors (TOVs) via headspace method with the use of an HNu Model PI-101 Photoionization detector (PID) equipped with a 10.2 eV lamp (calibrated to an isobutylene standard and referenced to benzene). The method detection limit of the instrument is 0.1 ppm (ECS Protocols – Appendix B). A copy of the August 2000 Environmental Site Assessment Report is provided as Appendix A.

Borings EP-1 through EP-4 and EP-9 were advanced in the immediate vicinity of the 10,000-gallon diesel UST. Borings EP-5 through EP-7 were advanced in the vicinity of two 1,000-gallon USTs. Boring EP-8 was advanced in the vicinity of the oil/water separator.

As part of the investigation, selected soil samples were submitted for laboratory analysis for the presence of Volatile Petroleum Hydrocarbons (VPH) and Extractable Petroleum Hydrocarbon (EPH). VPH and EPH C<sub>5</sub>-C<sub>8</sub> aliphatics, C<sub>9</sub>-C<sub>10</sub> aromatics, C<sub>9</sub>-C<sub>18</sub> aliphatics, C<sub>11</sub>-C<sub>22</sub> aromatics were detected in the vicinity of the 10,000-gallon diesel UST at concentrations greater than Reportable Concentrations (RCs). EPH Targeted analytes naphthalene and 2-methylnaphthalene were also detected at concentrations above RCs. This condition required notification to the MADEP within 120-days of knowledge. A summary of laboratory analysis is presented in Table 1. Copies of Certificates of Laboratory Analysis are provided as Appendix C.

Groundwater samples were collected from five existing wells (MW-1 through MW-5) on July 24 and August 8, 2000, and analyzed for VPH, EPH and Volatile Organic Compounds (VOCs). VPH and EPH hydrocarbons ranges or target analytes were not detected above method detection limits. Tetrachloroethene (PCE) was detected in groundwater samples collected from wells MW-2 and MW-4 at a concentration of 1.4 μg/L, which is less than the RCs for groundwater category RCGW-2. No other VOCs were detected in any groundwater samples. A summary of laboratory analysis is presented in Table 2. Certificates of Laboratory Analysis are provided as Appendix C. This RAO addresses the release of diesel fuel from the 10,000-gallon UST. No known source of chlorinated solvents was identified during the completion of this RAO. In addition a soil sample (S-40) collected from the northeastern corner of the excavation (along the property boundary with the City of West Springfield) was analyzed for VOCs. VOCs were not detected at concentrations greater than laboratory method detection limits.

A Release Notification Form (RNF) was submitted to the MADEP in December of 2000 for the exceedances of RCs detected in soil samples collected from soil borings advanced in the vicinity of the former 10,000-gallon UST. A Notice of Responsibility (NOR) was issued by the MADEP on January 9, 2001, assigning RTN 1-13747.

#### 3.2 IMMEDIATE RESPONSE ACTION PLAN - JANUARY 2001

On November 20, 2000, a tank tightness test of the 10,000-gallon diesel UST was performed by Tanknology. The results of the test indicated that there was a likelihood that a leak in the inner wall of a double wall UST existed at a rate equal to or greater than 0.05 gallons per hour. This condition required notification to the MADEP within 72-hours. On November 22, 2000, ECS notified the MADEP of a threat of a reportable release of diesel fuel. The MADEP subsequently assigned RTN 1-13697 to the Site. On December 8, 2000, an NOR was issued to Trailer Works, Incorporated. At the time of the notification, the MADEP approved the removal of the UST.

An IRA Plan was submitted to the MADEP on January 17, 2001. The IRA Plan proposed the removal and disposal of the 10,000-gallon UST and the excavation of up to 100 yards of petroleum impacted soil.

# 4.0 IMMEDIATE RESPONSE ACTIONS

#### 4.1 UST REMOVAL ACTIVITIES

On April 23, 2001, tank removal activities were performed by Oil Recovery Corporation (Oil Recovery) of West Springfield, Massachusetts. Visual inspection of the tank indicated no evidence of holes, excessive corrosion of the metal. However, visual and olfactory evidence of soil contamination was observed in the vicinity of the soil borings advanced during the August 2000 Environmental Site Assessment. Contaminated soil was stockpiled on and over 6-mil polyvinyl sheeting.

During the period from April 24, 2001 to April 25, 2001, ECS and Oil Recovery proceeded with the removal of contaminated soil. Soil contamination was encountered approximately 10 feet below grade (fbg). This was determined by visual, olfactory and field screening. During excavation activities, discrete soil samples were collected from the sidewalls and base of the excavation and field screened using a Dexsil Petroflag Hydrocarbon Analyzer Kit (Petroflag®). The Petroflag® uses a system of extraction solvents, analytical reagents and a portable, battery powered spectrometer to determine Total Petroleum Hydrocarbons (TPH) contamination levels in soils. A methanol extraction solvent is mixed with 10 grams of soil to remove the hydrocarbons from the soil sample. The solvent and suspended materials are then filtered from the extract through a syringe to prevent interference. The sample is then added into a 6-ml vial containing a color developing reagent and the soil extract produces a response in proportion to the amount of hydrocarbon contained in the soil sample. The sample is then placed in a portable spectrometer, which reports the TPH concentration of the sample in ppm.

Soil samples collected from the excavation, which exhibited a Petroflag concentration greater than 500 ppm, were excavated. Based on field observation approximately 250 cubic yards of contaminated soil was excavated from the Site and transported off-site for recycling at Theodore Ondricks Company, LLC under a Bill of Lading (BOL). The actual tonnage excavated from the Site totaled 428.28 tons. A copy of the BOL is provided as Appendix D.

The MADEP approved the removal of 100 cubic yards of contaminated soil. Therefore, ECS verbally notified the MADEP when it was evident that the 100 cubic yard limit would be exceeded. MADEP subsequently approved the excavation of up to 250 yards of contaminated soil.

The final excavated measured approximately 80 feet long by 40 feet wide and encompassed former boring locations where EPH was detected. To adequately evaluate residual contaminant levels within the tank grave, 13 post excavation soil samples were submitted for laboratory analysis. Eight sidewalls samples collected from 8 to 15 feet and five base samples collected from the base at a depth of 16-17 fbg were submitted for laboratory analysis. Post excavation soil samples S-1, S-3, S-13, S-17, S-20, S-23, S-24, S-25, S-27, S-31, S-32, S-37 and S-40 were collected and submitted to Spectrum Analytical for VPH and EPH analysis. One soil sample (S-40) was also submitted for analysis of VOCs using United State Environmental Protection Agency (USEPA) Method 8260B, due the presence of VOCs detected in a sample from monitoring well MW-2.

# 4.2 GROUNDWATER SAMPLING

On May 9, 2001, representative groundwater samples were collected from monitoring wells MW-2 and MW-3 following ECS standard operating procedures. Groundwater sampling was attempted in three other wells MW-1, MW-4 and MW-5, however, these wells could not be located. Several attempts (i.e. metal detectors) to locate these wells was conducted as part this investigation. Each monitoring well

was gauged for depth to water and total well depth using an electronic water level indicator. Each well was then purged of three to five well volumes of groundwater or until the well was dry using low flow sampling protocols. Groundwater Sampling Logs are provided at Appendix E. Groundwater samples from each monitoring well were analyzed for VPH, EPH and VOCs.

All groundwater samples collected for laboratory analysis were preserved and handled per methodspecific criteria, and submitted under chain-of-custody (COC) to Spectrum Analytical, a Massachusettscertified analytical laboratory. Documentation of sample handling is provided on COC contained in Appendix C, Certificates of Laboratory Analysis.

# 4.3 DATA POINT SURVEY

For the purpose of determining groundwater flow direction at the Site, monitoring well MW-1 was reinstalled on November 12, 2001, using a hollow stem auger drilling rig. A survey of Site features and monitoring wells was conducted on November 15, 2000 by representatives of ECS. Additionally, the polyvinyl chloride (PVC) and protective casing of each monitoring well were surveyed for vertical location (elevation), referenced to a benchmark of 100 feet. All horizontal locations were rounded to the nearest 1-foot and all vertical locations were rounded to the nearest 0.01-foot. Data generated during ECS's property survey combined with water level measurements collected on September 4, 2001, were used to prepare the Site Plan and Water Table Contour Map (Figure 3).

# 4.4 IRA COMPLETION STATEMENT

Based on the results of this investigation, it is the opinion of ECS that no Imminent Hazards to health, safety, public welfare and the environment exist at the Site. All stockpiled remediation waste generated as a result of this IRA has been removed from the Site pursuant to 310 CMR 40.0030. It is the opinion of ECS that the IRA has been completed in accordance with 310 CMR 40.0410.

# 5.0 SITE GEOLOGY AND HYDROGEOLOGY

#### 5.1 GEOLOGY

#### 5.1.1 - Soils

The soil survey for Hampden County indicates the Site vicinity is comprised of "Hinckley-Windsor" association. In a typical profile of Hinckley, the surface layer is dark grayish brown loamy sand about 3 inches thick. The subsoil is loose yellowish brown loamy sand about 12 inches thick. The substratum is loose, light brown stratified sand and gravel to a depth of 60 inches or more. Permeability of Hinckley soil is rapid in the subsoil and very rapid in the substratum. The available water capacity is very low.

A typical profile of the Windsor soils, the surface layer is very friable, brown loamy sand about 7 inches thick. The subsoil is loose, single grained, strong brown coarse sand and loamy sand 16 inches thick. The substratum, is loose, single grained, yellowish brown sand to a depth of 60 inches.

IRA activities revealed that the subsurface soil consisted of very fine to fine sand to the maximum depth of 20 fbg.

# 5.1.2 - Bedrock Geology

According to the United States Geological Survey (USGS) bedrock beneath the Site consist of the Portland Formation of the Lower Jurassic Period. This formation consists of reddish-brown to pale red arkose and siltstone and gray sandstone, siltstone, and black shale interpreted as lake bed deposits (USGS, 1983). Bedrock was not encountered during excavation activities.

# 5.2 HYDROGEOLOGY

#### 5.2.1 - Surface Water

No natural ponds, streams or other surface water exists on the Site. The closest surface water body is the Connecticut River, which is situated 500 feet to the northeast/east. A stormwater detention basin abuts the Site to the north which is owned and operated by the Town of West Springfield. This basin is primarily utilized during period of a prolonged rain event.

#### 5.2.2 - Depth to Groundwater

Depth to groundwater in all wells on the Site was gauged on September 4, 2001. The average depth to groundwater on the Site based on the September 4, 2001 gauging is 18.89 fbg, as measured from the top of the PVC riser. Depth to groundwater ranged from 18.05 fbg in well MW-2 (located to the northeast of the excavation area on property owned by the City) to 19.69 fbg in well MW-3 (located in the southeastern portion of the Site).

# 5.2.3 - Groundwater Flow Direction

Groundwater flow beneath the Site was determined based on potentiometric surface elevations measured on September 4, 2001. Groundwater flow as interpreted from data collected on this date is towards the northeast (Figure 3).

# 6.0 ENVIRONMENTAL FATE & TRANSPORT OF PETROLEUM

#### 6.1 PHYSICAL AND CHEMICAL CHARACTERISTICS OF PETROLEUM

The oil/hazardous material (OHM) of concern has been identified as fuel oil, which was released by the UST system formerly located in the northern portion of the Site.

# 6.1.1 - Diesel Fuel

Diesel fuel is a mixture of hydrocarbons derived through the processing of petroleum. The color, chemical composition, and thus specific physiochemical characteristics can vary depending on the time of year and location of the refining process. Diesel fuel has a specific gravity of approximately 0.77 to 0.84, and therefore, tends to float on the top of the water table. The overall solubility of heating oil in water is very low. The flash point of diesel fuel is 163 to 357 °C. (MADEP Interim Final Petroleum Report-1994)

Diesel fuel is comprised of a complex mixture of aliphatics and aromatic hydrocarbons in the C<sub>9</sub> to C<sub>20</sub> range. The aromatic hydrocarbons, which typically account for 35 percent, are dominated by alkenes. Aliphatic compounds typically account for 64 percent of a diesel fuel product volume. (MADEP Interim Final Petroleum Report-1994.)

#### 6.1.2 - Perchloroethylene

Perchloroethylene is a non-flammable, colorless liquid, that is commonly used in dry cleaning as a solvent. The molecular formula for PCE, which is classified as a halogenated aliphatic hydrocarbon, is C<sub>2</sub>Cl<sub>4</sub>. PCE has a specific gravity greater than greater than 1, and therefore, tends to sink in water. The overall solubility of PCE in water is very low (<1 milligrams per liter (mg/L)).

PCE is highly volatile (vapor pressure 18.47 mm Hg) and its vapor has a vapor density of 5.7, resulting in a tendency for PCE vapors to sink in air or soil gas. The Henry's Law Constant for PCE is 1.8 x 10<sup>-2</sup> atm m³/mol. The Henry's Law Constant is a relative measure of a compound's potential to partition between aqueous phase and gaseous phase. In other words, the Henry's Law Constant is an indicator of a compound's ability to move between a dissolved state in water to a gaseous state in the atmosphere until equilibrium is achieved. This constant is defined by the vapor pressure and the water solubility of the compound, temperature, as well as the proximal concentration of the compound in the atmosphere. In relative terms, those compounds with higher Henry's Law Constants will have a greater affinity to partition from an aqueous phase into the gaseous phase.

#### 6.2 ENVIRONMENTAL FATE AND TRANSPORT OF PETROLEUM

Upon release to the subsurface heating oil will travel vertically through the vadose zone as non-aqueous phase liquid (NAPL). The rate of vertical migration is dependent largely on the permeability of the substrate and is highly influenced by stratigraphic variations. When the NAPL reaches the groundwater table, it tends to spread laterally, as petroleum is less dense than water. Once the NAPL comes in contact with the groundwater table, dissolution of the more soluble components of the bulk product occurs. Migration of the soluble fraction is dependent on the velocity of groundwater as well as natural attenuation processes.

Portions of the released product will remain adsorbed to the subsurface soils through which it passes. The percentage of release, which remains in the vadose zone, is related to the moisture content, surface charge density, soil particle size and compaction, and the organic content of soils. The adsorbed-phase is essentially immobile, yet represents a significant continuing source of potential groundwater impact via seasonal fluctuations of the water table elevation or infiltration. The adsorbed-phase may also exist below mid to high-level water table elevations due to migration of petroleum along the water table surface during low groundwater elevations.

Generally, the lower molecular weight components are those that occur in the dissolved- or vaporphases. Thus, the dissolved-phase occurring in groundwater and the vapor-phase occurring in the vadose zone represent a lower molecular weight fraction of the original chemical composition of the petroleum. The more volatile components of the released product will migrate via gaseous diffusion. The migration of vapors is dependent on both pressure and concentration gradients.

Petroleum hydrocarbons consist of many organic compounds, each with its own physical and chemical characteristics. Each of these individual constituents will adsorb to the soil matrix, volatilize into the soil vapor, and dissolve into the groundwater at various rates governed by these characteristics. These compounds are subject to biological and chemical mechanisms that influence their fate and transport in the subsurface. For this reason, petroleum hydrocarbons are characterized as reactive solutes, and thereby are subjected to attenuation processes (e.g., dispersion, sorption, volatilization, biodegradation and hydrolysis) as they are transported in a groundwater regime. Such attenuation processes partition the parent product into the chemicals of concern previously identified. The net result of these attenuation mechanisms is a reduction in the velocity and ultimate transport distance of the solute when compared to groundwater.

Several specific properties of petroleum are important for understanding the fate and transport of each compound identified in soil and groundwater. The following section describes some of the more important physiochemical properties. Appendix F provides information about each petroleum constituent identified at the Site.

Vapor Pressure is defined as the pressure exerted by a vapor that is in equilibrium with its aqueous phase. The vapor pressure of an individual hydrocarbon compound is an indicator of the likelihood for the compound to volatilize. Compounds with higher vapor pressures will volatilize more readily than those compounds with lower vapor pressures.

The solubility of an individual hydrocarbon compound is an indicator of the potential mobility of an organic compound in the dissolved-phase. Upon reaching the groundwater table, compounds with higher solubilities will exhibit a relative increased mobility when compared to compounds that exhibit lower solubilities.

The Henry's Law Constant is a relative measure of a compound's potential to partition between aqueous phase and gaseous phase. In other words, the Henry's Law Constant is an indicator of a compounds ability to move between a dissolved state in water to a gaseous state in the atmosphere until equilibrium is achieved. This constant is defined by the vapor pressure and the water solubility of the compound, temperature, as well as the proximal concentration of the compound in the atmosphere. In relative terms, those compounds with higher Henry's Law Constants will have a greater affinity to partition from an aqueous phase into the gaseous phase.

The organic carbon partition coefficient (Koc) represents a measure of the potential for a solute to a disassociate from water and sorb to naturally occurring carbon (organic matter). Sorption onto naturally

occurring organic matter represents only one of the chemical and physical properties that can result in sorption of a solute onto the soil matrix. The degree of sorption to organic matter is directly controlled by the quantity of naturally occurring organic matter in the environment and the solutes affinity to adsorb to carbon (distribution coefficient). Compounds with higher Koc values will exhibit a greater affinity to sorb to carbon in the aquifer matrix than those with lower Koc values. All other factors held constant, the greater the sorption potential of a specific compound the lower its potential mobility in the groundwater regime.

One of the more significant of the processes, with respect to the fate of most petroleum hydrocarbon compounds, is biodegradation. Aromatic hydrocarbons are degraded aerobically by microbes through a variety of metabolic pathways that utilize molecular oxygen to break the aromatic compounds into intermediate compounds which can eventually be fed into the Krebs cycle. The final end products of the Krebs cycle include energy, carbon dioxide, and water. (Baker-1994)

Aerobic respiration (as it relates to naphthalene) is represented by the following stoichiometric equation:

In areas where aerobic respiration has depleted an aquifer of oxygen, microbial populations will shift to populations that utilize nitrate, ferric iron hydroxide, and sulfate as electron acceptors. These processes (as they relate to naphthalene) are represented by the following stoichiometric equations, which are provided in the order of microbial preference:

Denitrification - Equation 2: 
$$C_{10}H_8 + 9.6N0_3^- + 9.6H^+ ---> 10CO_2 + 8.8H_2^- 0 + 4.8N_2^-$$
  
Iron Reduction - Equation 3:  $C_{10}H_8 + 48Fe(0H)_3 + 96H^+ ---> 10CO_2 + 124H_2^- 0 + 48Fe^{2+}$   
Sulfate Reduction - Equation 4:  $C_{10}H_8 + 6SO_4^{-2-} + 12H^- ---> 10CO_2 + 4H_2^- 0 + 6H_2^- S$ 

In general, aliphatic hydrocarbons are easier to degrade than aromatic hydrocarbons. Straight chain aliphatic hydrocarbons in the range of  $C_{10}$  through  $C_{20}$  are readily degradable through aerobic degradation. However, degradation of aliphatic compounds with carbon chains of 9 carbon atoms or fewer, are more difficult to degrade.

Upon release to the subsurface, PCE will travel vertically through the vadose zone as non-aqueous phase liquid (NAPL). The rate of vertical migration is dependent largely on the permeability of the substrate and is highly influenced by stratigraphic variations. Refereed to as light NAPL or LNAPL, the solvent will travel slowly through the capillary fringe of the groundwater table in the downgradient direction. The rate of horizontal LNAPL migration is influenced by the soil porosity, the organic content of soil, the volume of available pore space not occupied by groundwater. LNAPL gradually dissipates as it migrates, losing its mass to groundwater through dissolution, to soil gas through volatilization and to soil through adsorption.

When PCE NAPL encounters groundwater much of the NAPL continues to migrate through groundwater until it reaches a physical confining layer (soil or bedrock with an extremely low vertical hydraulic conductivity).

Portions of the released solvents will remain adsorbed to the subsurface soils through which they pass. The percentage of release, which remains in the vadose zone, is related to the moisture content, surface charge density, soil particle size and compaction, and the organic content of soils and the partitioning

characteristics the particular solvent. PCE has less of a tendency to sorb to soil and will migrate a further distance from the release location. The adsorbed-phase is essentially immobile, but it typically represents a significant continuing source of potential groundwater impact via seasonal fluctuations of the water table elevation or infiltration if it is not remediated. Dense non aqueous phase liquid (DNAPL), such as PCE, which can impact soil well below the top of the water table, this phenomenon is less significant for Stoddard Solvent.

The more volatile components of the released product will migrate via gaseous diffusion. The vapors of PCE are denser than air and tend to sink in soil gas. The migration of vapors is also dependent on both pressure and concentration gradients.

Once dissolved in groundwater, PCE are subjected to attenuation processes (e.g., dispersion, sorption, volatilization, biodegradation and hydrolysis) as they are transported in a groundwater regime. The net result of these attenuation mechanisms is a reduction in the velocity and ultimate transport distance of the solute when compared to groundwater.

The most important process for the natural attenuation of PCE is reductive dechlorination. During this process, the chlorinated hydrocarbon is used as an electron acceptor and a chlorine atom is removed and replaced with a hydrogen atom. Reductive dechlorination occurs in a sequential process degrading PCE to trichloroethylene (TCE), to dichloroethylene (DCE) and eventually to vinyl chloride (VC). While all three isomers of DCE can be produced during the degradation of PCE, 1,1-DCE, which is the most toxic, is the least common. The stoichiometric equations representing the complete reductive halogenation of PCE are provided below:

It should be noted that the completeness and rate of the reductive dehalogenation processes are influenced by a variety of environmental factors including the presence of organic carbon and the reduction-oxidation state of the aquifer. PCE degradation rates are greatest under anaerobic, reductive conditions. Because the degradation of petroleum hydrocarbons creates these conditions, degradation of PCE is more rapid in aquifers that have been impacted by petroleum hydrocarbons.

The degradation products DCE and VC are also susceptible to biologically mediated reductionoxidation reaction. The reactions include the iron reduction, denitrification, and aerobic respiration. In these reactions, the chlorinated aliphatic hydrocarbons are mineralized to chloride, and ethene. The stoichiometric equations representing these processes are provided below:

DCE Oxidation - Equation 9: 
$$C_2H_2Cl_2 + 4H_2O ---> 2CO_2 + 10H^+ + 8e^- + 2Cl^-$$
  
VC Oxidation - Equation 10:  $C_2H_4Cl + 4H_2O ---> 2CO_2 + 11H^+ + 10e^- + Cl^-$ 

#### 6.3 POTENTIAL MIGRATION PATHWAYS OF OHM

The following potential migration pathways for petroleum hydrocarbons were evaluated during this investigation: air (vapors), groundwater, surface water and sediment. Preferential migration pathways (such as more permeable subsurface strata and utility lines) can expedite the migration of both vaporphase and dissolved-phase hydrocarbons.

Groundwater is likely to discharge into neighboring surface water bodies. Therefore, the migration of groundwater, impacted by dissolved-phase hydrocarbons, is considered a potential migration pathway. However, VPH and EPH were not detected in groundwater samples collected from monitoring wells MW-2 and MW-3. Chlorinated solvents have historically been detected in on-site and off-site wells. PCE, TCE, trans-1,2-dichloroethane, cis-1,2-dichloroethene, 1,1,1-trichloroethane, 1,1-dichloroethane and 1,1-dichloroethene were detected in groundwater samples collected in all wells at concentration less than applicable RCs. PCE, TCE and cis-1,2-dichloroethene were detected in groundwater samples collected as part of this investigation below RCs. PCE was also detected in groundwater samples collected during the August 2000 assessment, from wells MW-2 and MW-4 at a concentration of 1.4 μg/L, which is less than the RCs for groundwater category RCGW-2. No other VOCs were detected in any groundwater samples.

The Site and the area in the vicinity of and downgradient from the Site are paved and/or covered with gravel. Residual petroleum impacted soil is located at depths between 8 to 20 fbg. Exposure to vapors emanating from soils and groundwater in the subsurface on the Site is expected to be negligible. As noted above, groundwater at and in the vicinity of the Site is greater then 15 fbg and therefore, the groundwater is not considered a source of vapors to subsurface structures or buildings.

Because no surface water body exists at the Site, there is no potential for either surface water or sediment to convey petroleum away from the Site. Because crops or edible plants are not grown on-site for human consumption, food-chain pathways are not considered a potential migration pathway.

# 7.0 NATURE AND EXTENT OF CONTAMINATION

A remediation and assessment program including excavation of contaminated soil, soil and groundwater sampling, and analysis was conducted to collect data for characterization of the nature and extent of petroleum contamination at the Site.

Locations of all post excavation samples are shown on Figure 3. Soil sample screening data for Petroflag results are included in Table 3. Laboratory analytical results are summarized in Table 4 and 5.

#### 7.1 SOIL AND GROUNDWATER BACKGROUND CONCENTRATIONS

According to the MCP [310 CMR 40.0006 (12)] background means those levels of oil and hazardous material that would exist in the absence of the disposal site of concern which are either:

- (a) ubiquitous and consistently present in the environment at and in the vicinity of the disposal site of concern; and attributable to geologic or ecological conditions, or atmospheric deposition of industrial process or engine emissions;
- (b) attributable to coal ash or wood ash associated with fill material;
- (c) releases to groundwater from a public water supply system; or
- (d) petroleum residues that are incidental to the normal operation of motor vehicles.

The Site is used as a truck and trailer service company. The Site was formerly used as an office, storage warehouse and service garage. Property activities have apparently resulted in the release of oil to the soil. These contaminants would not have existed in the absence of activities at the Site. Background levels for petroleum-derived contaminants are considered zero or not detectable.

#### 7.2 HORIZONTAL AND VERTICAL EXTENT OF OHM

The source of petroleum impact to soil has been identified as the UST system formerly located in the northern portion of the property, which was removed in April of 2001. During removal activities approximately 428.28 tons of soil was excavated and transported off-site.

The extent of the release area was determined based on detected TPH concentrations in field screening and detected VPH and EPH concentrations in post excavation soil samples. VPH C<sub>5</sub>-C<sub>8</sub> aliphatics, C<sub>9</sub>-C<sub>12</sub> aliphatics and C<sub>9</sub>-C<sub>10</sub> aromatics were detected in post excavation soil samples S-23 and S-32 at concentrations less then Method 1 Standards. VPH target analytes naphthalene and total xylenes were detected less than Method 1 Standards.

EPH C<sub>9</sub>-C<sub>18</sub> aliphatics, C<sub>19</sub>-C<sub>36</sub> aliphatics and C<sub>11</sub>-C<sub>22</sub> aromatics were detected in soil sample S-32 at concentration below Method 1 Standards. Targeted EPH analytes naphthalene, 2-methylnaphthalene, fluorene, phenanthrene and pyrene were also detected in soil samples collected from S-23 and S-32 at concentration less than Method 1 Standards. No chlorinated solvents were detected in soil sample S-40.

Based on the aforementioned information, the extent of the contamination is interpreted to be limited to the volume of soil which was excavated during April 2001. Limited residual concentration is present in the immediate vicinity of the tank excavation.

EPH aliphatics and aromatics and targeted analytes were not detected in groundwater samples collected from wells MW-2 and MW-3.

Chlorinated solvents have historically been detected in on-site and off-site wells. PCE, TCE, trans-1,2-dichloroethane, cis-1,2-dichloroethene, 1,1,1-trichloroethane, 1,1-dichloroethane and 1,1-dichloroethene were detected in groundwater samples collected in all wells at concentration less than applicable RCs. PCE, TCE and cis-1,2-dichloroethene were detected in groundwater samples collected as part of this investigation below RCs. PCE was also detected in groundwater samples collected during the August 2000 assessment, from wells MW-2 and MW-4 at a concentration of 1.4 microgram µg/L, which is less than the RCs for groundwater category RCGW-2. No other VOCs were detected in any groundwater samples.

Based on historical groundwater sampling data, contaminants were detected in all on-site and offsite wells. Elevated concentrations of chlorinated solvents were detected in groundwater samples collected from well MW-5 (this well could not be located during the August 2000 and this investigation). This well is located upgradient of the diesel release area. 1,1,1-trichloroethane and PCE were detected in groundwater samples collected from MW-3 in November of 1989, October 1990, April 1991 and August 1994. No chlorinated solvents were detected in groundwater samples collected from well MW-3 (August 2000 and May 2001) above the PQL.

# 8.0 SITE RISK CHARACTERIZATION

A characterization of the risk of harm to health, safety, public welfare and the environment has been performed to provide quantitative and qualitative information to evaluate the need for remedial actions to mitigate such risks. This risk characterization has been conducted in accordance with MCP Method 1 as described in 310 CMR 40.0970. Method 1 is applicable to the Site because assessment has determined that contamination is limited to soil and/or groundwater, contaminants are not known to bioaccumulate, and there are promulgated Method 1 standards for all contaminants of concern at the Site. The risk characterization is based on MA DEP policy "Guidance for Disposal Site Risk Characterization" (BWSC ORS-95-141, July 1995) and the MCP (310 CMR 40.0000).

The Site Risk Characterization consists in summary of a description of the Site, the contaminants of concern, potential receptors of the contaminants, and exposure points. EPCs of contaminants are compared to applicable Method 1 standards to determine whether significant risk exists and whether remediation is required.

#### 8.1 CURRENT AND FORESEEABLE FUTURE SITE USES

Current and reasonably foreseeable uses of the Site must be addressed to evaluate exposures. The foreseeable period of time for the Site is defined as an unlimited period of time. The Site is currently utilized as a truck and trailer service facility. There are full and/or part-time employees located or assigned to work at the facility. Future potential uses and activities at the Site include commercial and residential development and construction of subsurface utilities associated with redevelopment.

#### 8.2 IDENTIFICATION OF HUMAN RECEPTORS

Human receptors were identified with consideration to current and foreseeable activities and uses of the Site. The Site is currently utilized as a truck and trailer service company and the employees who work in the facility are considered potential receptors. Employees are characterized as adults, including women of child bearing age. Trespassers of the property may be considered potential receptors and can be characterized as the general public, including children and women of child bearing age.

In the event the facility was replaced with a residential structure, human receptors would include future life long residents, characterized as the general public (including children and women of child bearing age). Other potential human receptors considered are construction and service workers associated with the development of the property, site utilities and landscaping. Such workers could potentially be exposed to site soils and groundwater if excavation is involved.

Use of the Site groundwater for drinking purposes is not considered to be consistent with the current or foreseeable land use based on the following information:

- According the MADEP Site Scoring Map generated by the Mass GIS, and information obtained from the West Springfield Board of Health, there are no community surface or groundwater drinking supplies within a half-mile radius of the Site.
- Based upon information obtained from the West Springfield Board of Health, there are no
  private drinking water supplies within a half-mile radius of the Site.

- A municipal drinking water supply source is available within 500 feet of the Site and surrounding properties.
- The Site is not located within a PPA and/or IWPA.

#### 8.3 IDENTIFICATION OF ENVIRONMENTAL RECEPTORS

The Site is situated in the Connecticut River Drainage Basin and is located within 500 feet of the Connecticut River. According to the Massachusetts Natural Heritage Atlas, 2000-2001 editions, there are no Estimated Habitats of Rare Wetlands Wildlife and Certified Vernal Pools within a 500-foot radius of the Site. Because there are no surface water bodies present at the Site, shellfish and other aquatic biota are not present.

# 8.4 IDENTIFICATION OF SOIL AND GROUNDWATER CATEGORIES

Soil and groundwater at the Site are categorized according to the risk characterization guidelines of the MCP, 310 CMR 40.0900, Procedures and Standards for the Characterization of the Risk of Harm to Health, Safety, Public Welfare, and the Environment. Applicable groundwater and soil categories were determined from 310 CMR 40.0930, Identification of Site Groundwater and Soil Categories.

## 8.4.1 - Groundwater Category

The categorization of groundwater for risk characterization is based on current and potential use of groundwater, location of structures on the Site, and depth to groundwater. According to the DEP BWSC MassGIS - Springfield North Quadrangle the Site is not located within the boundaries of a PPA, a DEP approved Zone II Area and/or a IWPA. The average depth to groundwater at the Site and downgradient of the Site is estimated to be greater than 15 fbg.

Groundwater at all disposal sites shall be considered a potential source of discharge to surface water and shall be categorized, at a minimum, as category GW-3. Groundwater is defined as Category GW-2 if it is located within 30 feet of an occupied structure, and the average annual depth to groundwater is greater than 15 feet. Category GW-2 groundwater is considered to be a potential source of vapors of oil and/or hazardous material to indoor air.

Due to the fact that groundwater is estimated to be at a depth greater than 15 fbg, the above criteria place the Site groundwater in Groundwater Category GW-3.

#### 8.4.2 - Soil Category

Categorization of soil for risk characterization is based on the potential for exposure by adults and children. The Site is currently used as a truck and trailer service facility and there are no plans for further (re)development.

• Frequency of Use: The frequency of use for employees is considered high. The Site building is accessed frequently during the day due to the presence of employees working full time shifts. Children (15 years or younger) and trespassers are present at the Site only as infrequent visitors characterizing their frequency of use as low. The frequency of future residence would be considered high and construction workers, utility workers would be considered low.

- Intensity of Use: Intensity of use for employees is considered to be low because none of the activities that employee's may perform would access or disturb soil beneath the building or the asphalt parking area. The intensity of use by future residence, construction worker and utility work would be considered high because activities at the Site performed would likely access or disturb subsurface soils.
- Accessibility: The Site soil beneath the paved parking area is characterized as
  potentially accessible. It is assumed that the Site area will remained paved. In the future
  if the pavement is removed from this area soils at a depth of 3 to 15 fbg would be
  characterized at potentially accessible and soil at a depth of 0 to 3 fbg would be
  accessible.

The above criteria place the Site soils in Soil Categories S-3/GW-3.

To evaluate the potential for an Activity and Use Limitation (AUL) to be implemented at the Site, post excavation soil concentrations were also compared to the more stringent Soil MCP Method 1 Standards Category S-1/GW-3. In accordance to 310 CMR 40.1012(1) any disposal site or portion of the disposal site for which an RAO is based on MCP Method 1 or 2 Soil Standards and the EPCs of OHM materials exceed the S-1 Standards but meet applicable S-2 standards an AUL shall be implemented to achieve or maintain a level of No Significant Risk.

# 8.5 IDENTIFICATION OF EXPOSURE POINTS, PATHWAYS AND CONCENTRATIONS

Exposure points are defined as locations where potential contact between human or environmental receptors with a release petroleum occurs. Exposure pathways are the mechanism through which exposure would occur, such as inhalation or dermal absorption. The following pathways were identified based upon the identified and potential receptors and the site characteristics:

- Residents of a hypothetical residential development would come into direct contact with soils, and potentially consume soil and/or grow fruits and vegetables on the Site.
- Utility and/or construction workers of a hypothetical re-development would come into direct contact with soils.
- Connecticut River or other surface water body receives groundwater from the Site.

Because depth to groundwater at the Site is at a level greater than 15 fbg, humans occupying structures above the groundwater are not considered potential receptors for inhaling vapors which had partitioned from the groundwater and migrated into the building.

Exposure Point Concentrations (EPCs) for soil and groundwater were determined using the maximum concentrations of each individual analyte detected by laboratory analysis. Only samples which contained petroleum at concentrations exceeding the Practical Quantitation Limits (PQL) and collected from within the impacted areas were utilized for EPC calculation. EPCs in groundwater consist of the highest concentrations for each individual analyte detected in each well. EPCs are summarized in Tables 6 and 7.

#### 8.6 CHARACTERIZING RISK

## 8.6.1 - Exposure Point Concentrations for Soil

EPCs for soil were compared to applicable Method 1 standards to evaluate risk at the Site. The EPCs for all compounds analyzed in soil samples are shown with the applicable Method 1 Soil Standards in Table 6. All EPCs are below the most stringent Method 1 Standards.

## 8.6.2 - Exposure Point Concentrations for Groundwater

All groundwater EPCs are below applicable Method 1 Standards (see Table 7). Concentrations of chlorinated solvents were detected in groundwater samples collected from well MW-1, MW-2, MW-3 MW-4 and MW-5 at concentrations less than RCs and Method 1 Standards. This RAO specifically addresses the release of diesel fuel from the 10,000-gallon UST. No known source of chlorinated solvents was identified during the completion of this RAO. In addition a soil sample (S-40) collected from the northeastern corner of the excavation (along the property boundary with the City of West Springfield) was analyzed for VOCs. VOCs were not detected at concentrations greater than laboratory method detection limits.

#### 8.7 CHARACTERIZATION OF RISK TO SAFETY

The risk of harm to safety is evaluated according to the MCP requirements as specified in 310 CMR 40.0960. The conditions at the disposal site related to the contamination do not currently pose a threat of physical harm or bodily injury to people. There are no rusted or corroded drums or containers, open pits, lagoons, or other dangerous structures. There is no threat of fire or explosion. There are no uncontained corrosive, reactive, or flammable materials.

#### 8.8 FEASIBILITY OF ACHIEVING OR APPROACHING BACKGROUND CONCENTRATIONS

Excavation and replacement of impacted soils have achieved a Permanent Solution in which the remaining concentrations of OHM at all soil sample points are either below laboratory method detection limits, or are below the Method 1 Standards for the Site. Therefore, the Site conditions (with respect to the OHM impact to soil) can be said to be approaching background concentrations. While it would be technically feasible for additional excavation and replacement of impacted soil to reduce residual concentrations to background, this excavation would require the remobilization, removal of the backfill material, excavation, off-site disposal and restoration of the Site. The cost to perform excavation is estimated to be approximately \$10,000.00. Considering that the conditions at the Wayside Avenue property does not constitute a Significant Risk, the incremental costs of conducting the additional remediation is substantial and disproportionate to the incremental benefit of risk reduction, environmental restoration monetary and non-pecuniary value.

# 9.0 CONCLUSIONS

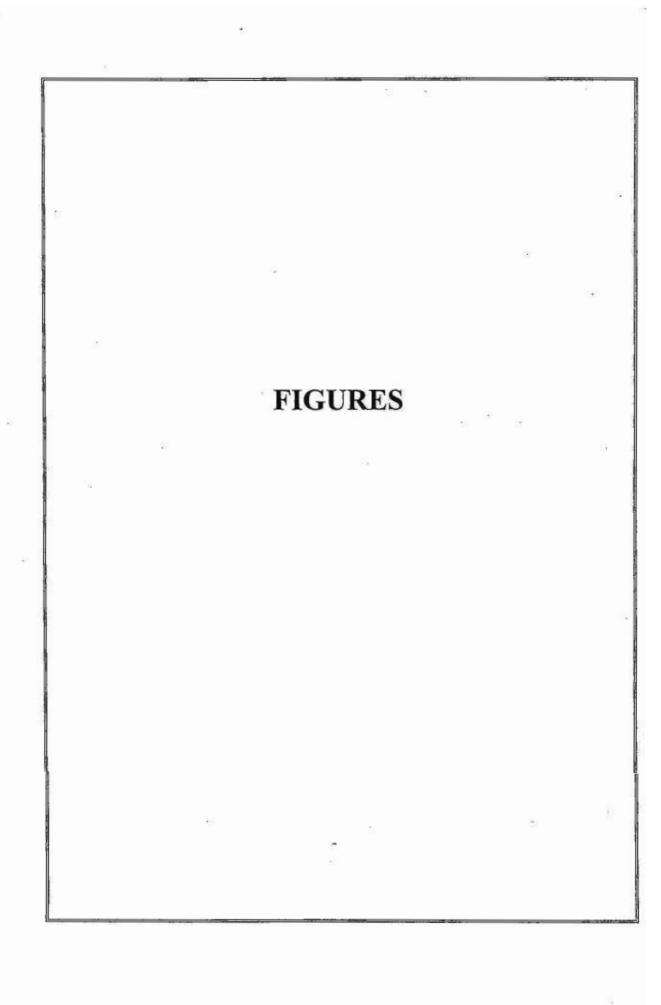
On behalf of T Works, Inc., ECS has completed an IRA Completion and RAO Report for the property located at 115 Wayside Avenue in Chicopee, Massachusetts. The Site defined as the areas proximal to, and downgradient of the former 10,000-gallon diesel UST located in the northeastern portion of the property. This RAO was conducted to satisfy the requirements of Massachusetts General Laws (MGL) Chapter 21E and the MCP, 310 CMR 40.0000.

- The Site is owned by T Works, Inc., and is currently utilized as a as a truck and trailer service company.
- The 10,000-gallon diesel UST that was removed in April of 2001 is the likely source of petroleum at the Site.
- From the period of April 23, 2001 to April 25, 2001, IRA activities including the excavation of 428.28 tons of contaminated soil and collection of post excavation soil samples for field screening and laboratory analysis.
- Groundwater flow was estimated to be toward the northeast. The Site is not located within a PPA, IWPA and/or a DEP Zone II area. Average depth to groundwater at the Site and downgradient of the Site is estimated to be greater than 15 fbg.
- Post excavation soil samples were submitted for laboratory analysis of VPH and EPH. VPH C<sub>5</sub>-C<sub>8</sub> aliphatics, C<sub>9</sub>-C<sub>12</sub> aliphatics and C<sub>9</sub>-C<sub>10</sub> aromatics were detected in post excavation soil samples S-23 and S-32 at concentrations less then Method 1 Standards. VPH target analytes naphthalene and total xylenes were detected at concentrations less than Method 1 Standards. EPH C<sub>9</sub>-C<sub>18</sub> aliphatics, C<sub>19</sub>-C<sub>36</sub> aliphatics and C<sub>11</sub>-C<sub>22</sub> aromatics were detected in soil sample S-32 at concentration below Method 1 Standards. Targeted EPH analytes naphthalene, 2-methylnaphthalene, fluorene, phenanthrene and pyrene were also detected in soil samples collected from S-23 and S-32 at concentration less than Method 1 Standards.
- No EPH aliphatics and aromatics and targeted analytes were detected in groundwater samples
  collected from wells MW-2 and MW-3. Chlorinated solvents including PCE, TCE and cis-1,2dichloroethene were detected in groundwater samples collected from well MW-2 at
  concentrations less than RCs.
- In order to evaluate whether a level of No Significant Risk exists for foreseeable Site activities and
  uses, the MCP Method I Soil Standards S-1/2/3/GW-3 were used for characterizing risk associated
  with OHM detected at the Site.
- Soil EPCs did not exceed applicable MCP Method 1 Soil Standards S-1/2/3/GW-3.
- Groundwater EPCs did not exceed applicable MCP Method 1 Groundwater Standards GW-3.
   Chlorinated solvents including 1,1,1-trichloroethane, PCE, TCE, trans-1,2-dichloroethene, cis-1,2-dichloroethene, 1,1-dichloroethane and 1,1-dichloroethene were detected in groundwater samples collected from alls wells at concentration less than RCs. In addition, the highest concentrations of chlorinated solvents were detected in groundwater samples collected from well

MW-5. This well could not be sampled during the August 2000 and this investigation due to the fact that the well could not be located. No known source of chlorinated solvents was identified during the completion of this RAO. In addition a soil sample (S-40) collected from the northeastern corner of the excavation (along the property boundary with the City of West Springfield) was analyzed for VOCs. VOCs were not detected at concentrations greater than laboratory method detection limits.

Based on the assessment and remedial activities conducted at the Site, it was determined that no further remedial response actions are needed at the Site to achieve a condition of No Significant Risk. The Site qualifies for a Class A-2 RAO based on the following:

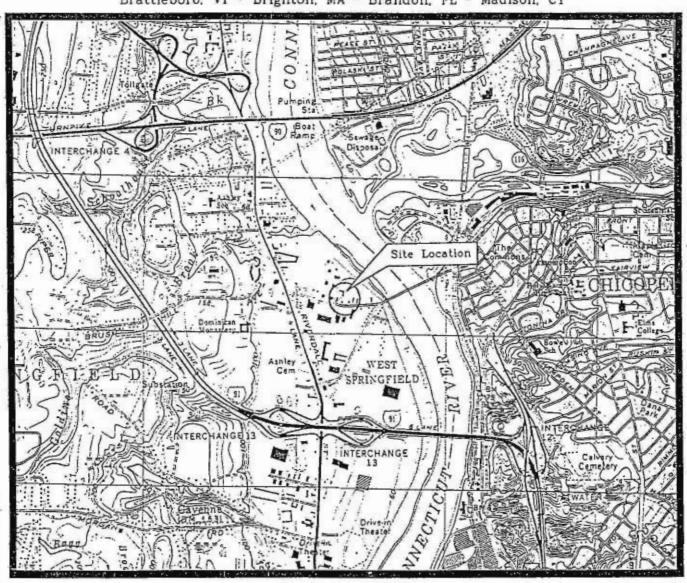
- Response actions have been conducted at the Site in order to achieve a level of No Significant Risk;
- Concentrations of VPH detected at the Site meet applicable Method 1 Risk Characterization Standards and do not exceed the Upper Concentration Limit (UCL) in soil.
- Background concentrations have been achieved at the Site.
- This RAO ensures a level of control of each identified substance of concern at a Site or in the surrounding environment such that no such substance of concern shall present a significant risk of harm to health, safety, public welfare or the environment during any foreseeable period of time.
- No AUL is needed to maintain a level of No Significant Risk.





# ENVIRONMENTAL COMPLIANCE SERVICES, INC.

588 Silver Street \* Agawam, MA 01001 Brattleboro, VT \* Brighton, MA \* Brandon, FL \* Madison, CT



Scale 1: 25,000

1 Mile

Contour Interval 10 Feet

Base Map: U.S. Geological Survey; Quadrangle Location: Springfield North, MA

Map Edited: 1984

Photorevised: 1979

Photoinspected: None

North

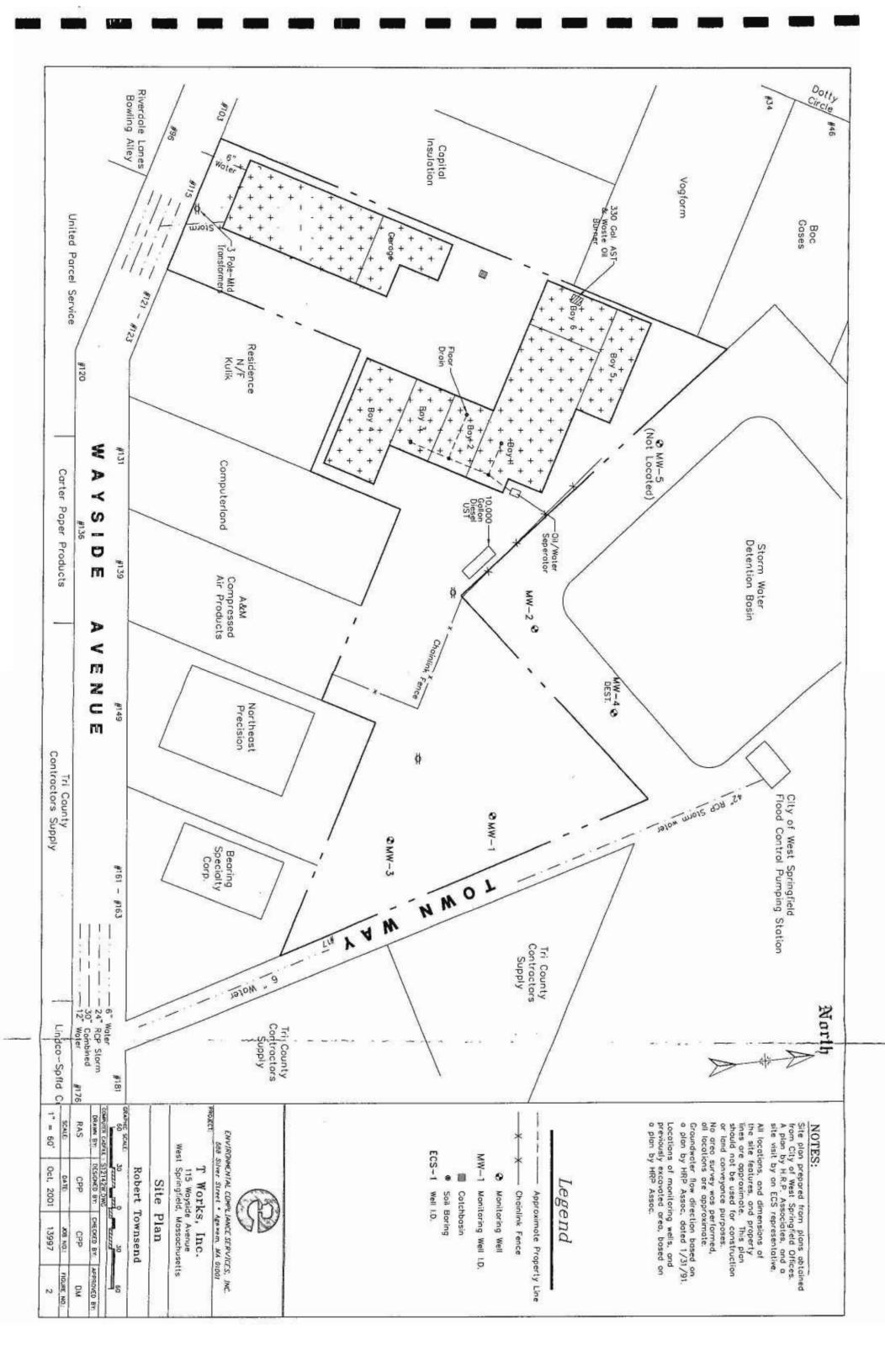
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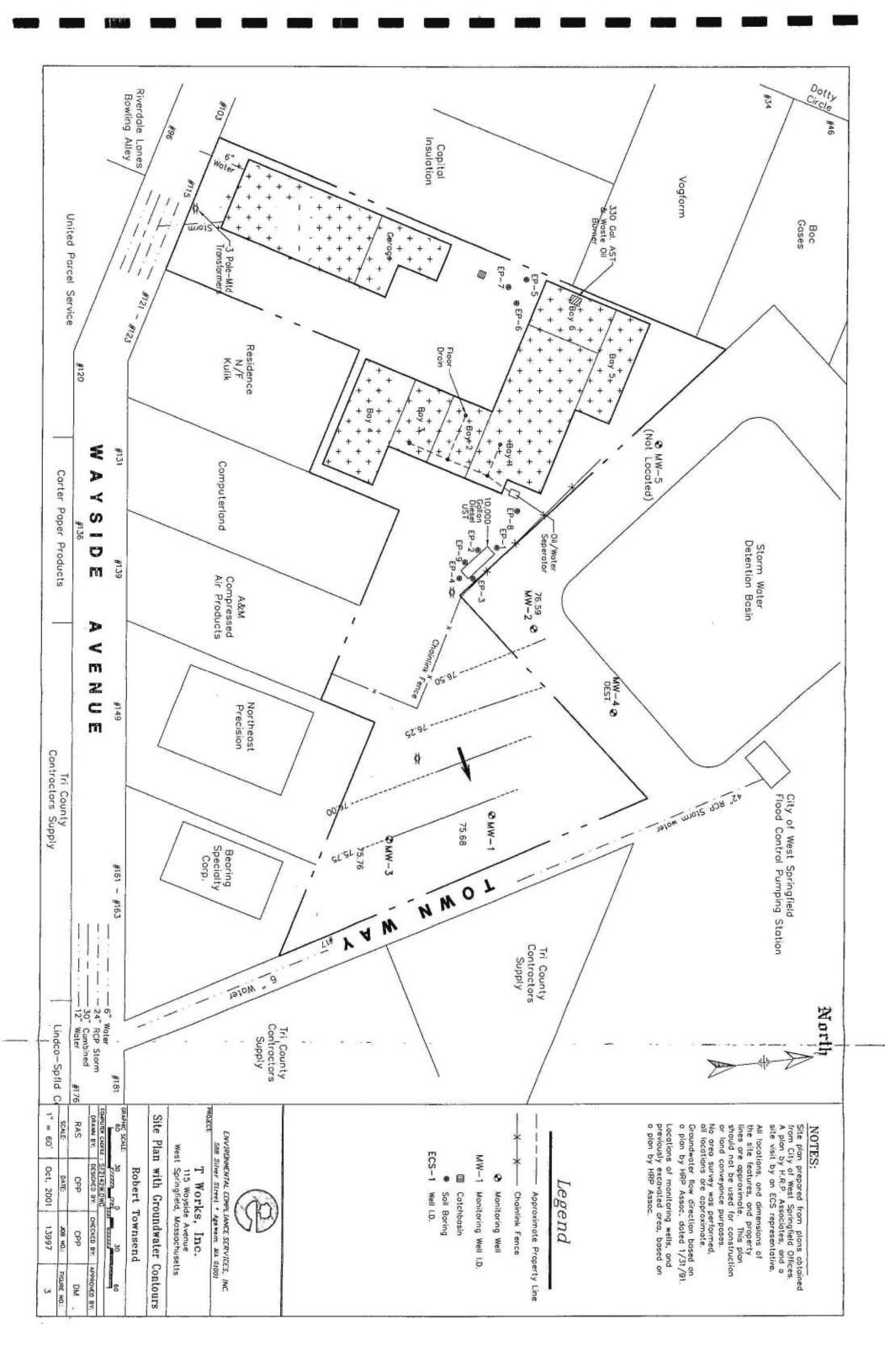
115 Wayside Avenue West Springfield, Massachusetts AutoCAD File: L13997.DWG

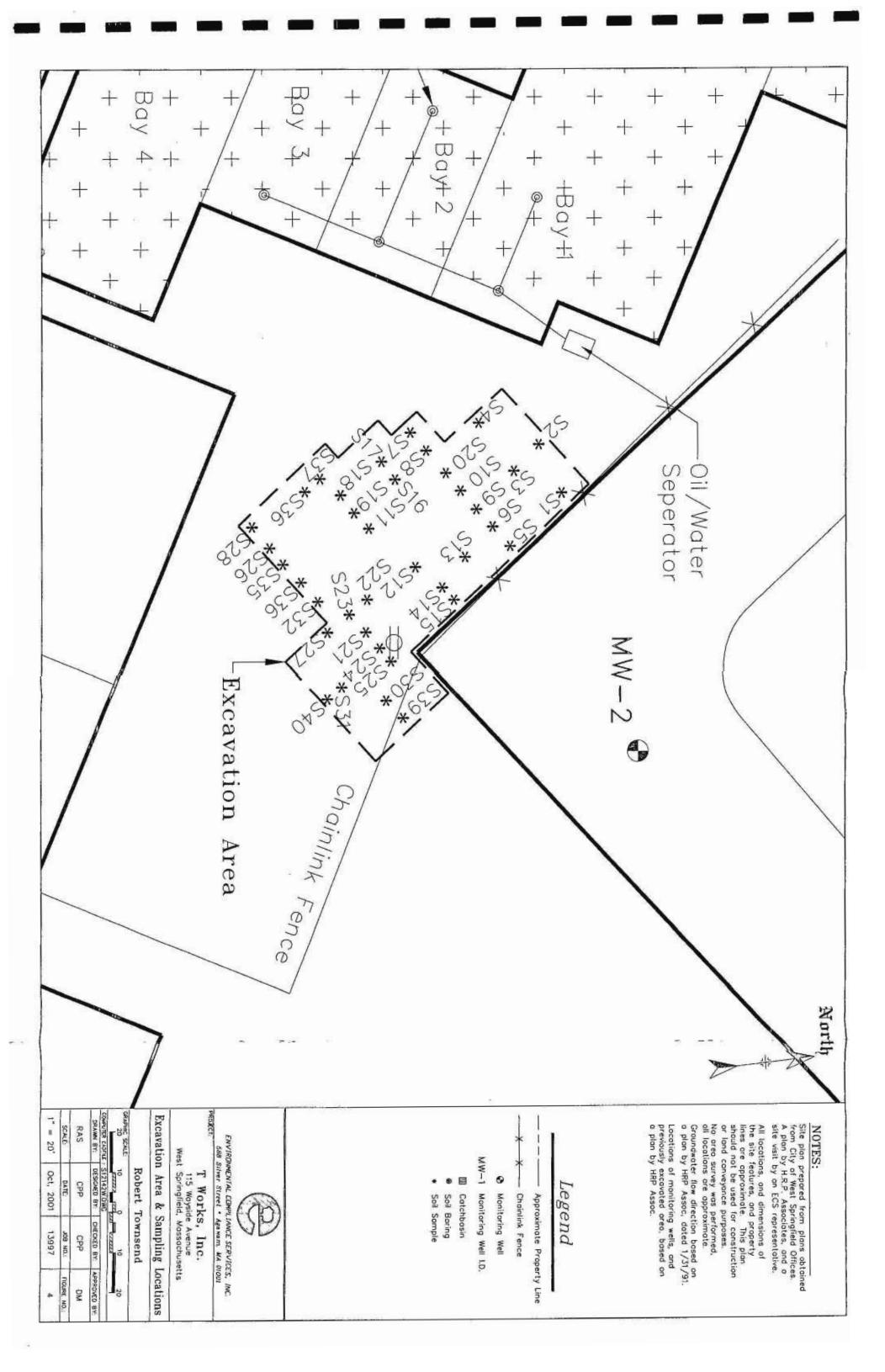
Site Locus

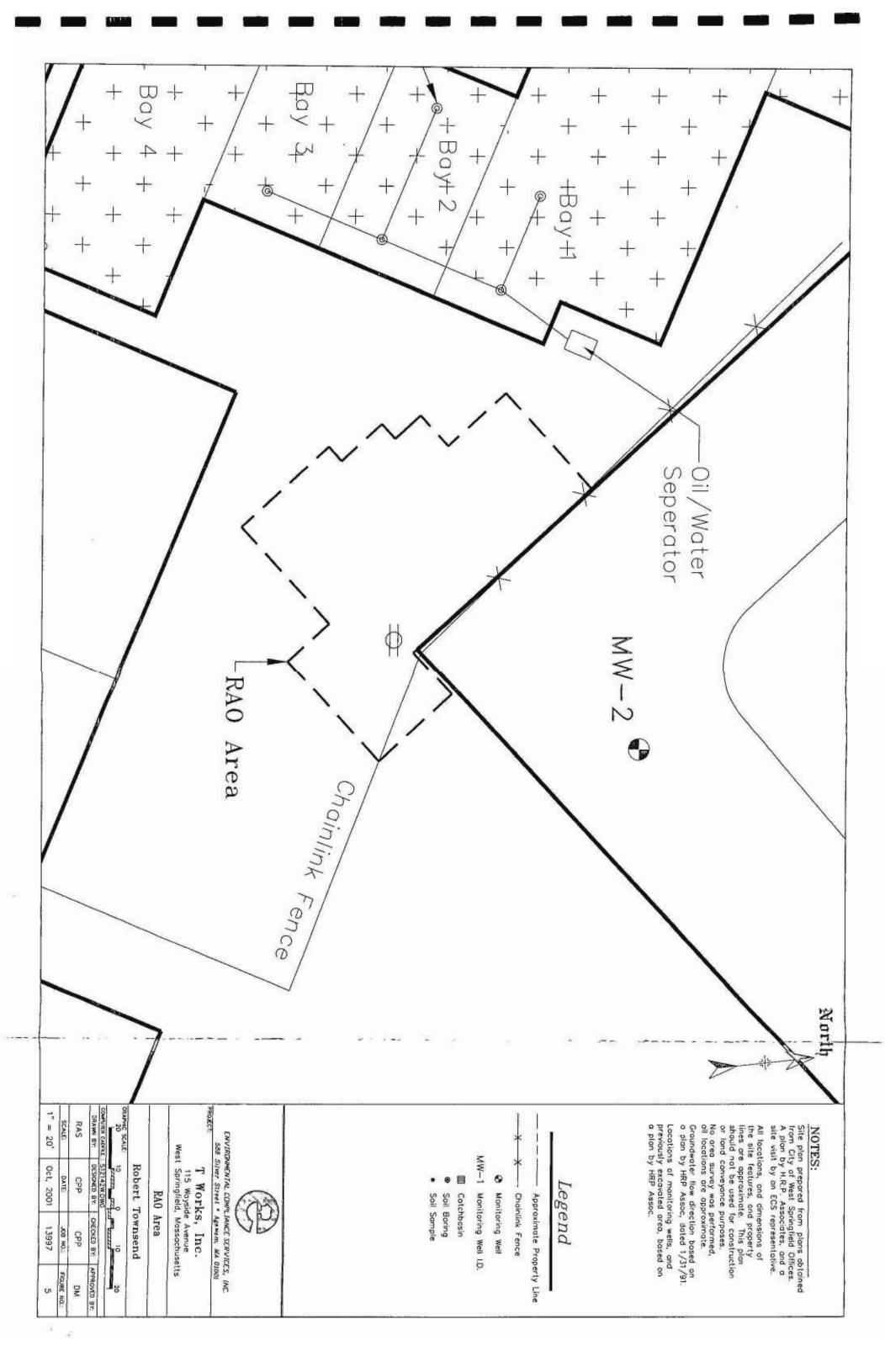
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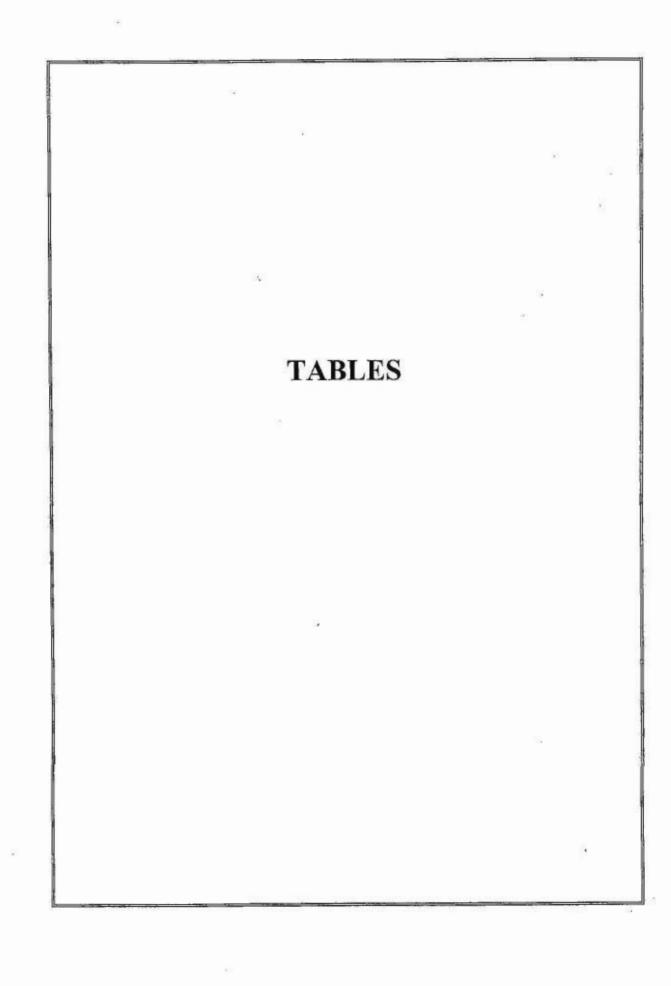
Figure ·











cation  Date  artics (mg/Kg) <sup>(1)</sup> iphatics Hydrocarbons  diphatics Hydrocarbons  cromatics Hydrocarbons  (ug/Kg) <sup>(1)</sup> tene  rt-butyl ether	EP-9 12-14*  7/28/00  36  39  100  ND/720  3,800  ND/720	EP-2 6-8° 7/25/00  108 386 520  ND/800 14,400	EP-4 2-4' 7/25/00  ND/3.39 26 39  ND/230  ND/230	Reportable Concentrations <sup>(2)</sup> RCS-1  100 1,900 100
iphatics (mg/Kg) <sup>(1)</sup> iphatics Hydrocarbons Liphatics Hydrocarbons tromatics Hydrocarbons (ug/Kg) <sup>(1)</sup> tene rt-butyl ether	36 39 100 ND/720 3,800	108 386 520 ND/800	ND/3.39 26 39 ND/230	100 1,000 100
iphatics Hydrocarbons Liphatics Hydrocarbons Lromatics Hydrocarbons (ug/Kg) <sup>(1)</sup> Lene rt-butyl ether	39 100 ND/720 3,800	386 520 ND/800	26 39 ND/230	1,000
Liphatics Hydrocarbons romatics Hydrocarbons (ug/Kg) <sup>(1)</sup> tene	39 100 ND/720 3,800	386 520 ND/800	26 39 ND/230	1,000
(ug/Kg) <sup>(1)</sup> tene rt-butyl ether	ND/720 3,800	520 ND/800	39 ND/230	100
(ug/Kg) <sup>(1)</sup> tene rt-butyl ether	ND/720 3,800	ND/800	ND/230	
ene rt-butyl ether	3,800			10,000
rt-butyl ether	3,800			10,000
rt-butyl ether		14,400	ND/226	
	ND/720		ND(250	80,000
ene		ND/800	ND/230	300
	7,600	48,000	4,900	4,000
9570): M	ND/720	ND/800	ND/230	90,000
nes	10,600	41,600	ND/450	500,000(3)
	5,400	20,000	ND/230	500,000
natics (mg/Kg) <sup>(1)</sup>			110000	
	ND/30	1,300	ND/30	1,000
Aliphatics Hydrocarbons	ND/30	250	39	2,500
Aromatics Hydrocarbons	ND/30	1,299	ND/30	200
alytes (ug/Kg) <sup>(1)</sup>			100 20	NOTE OF THE RESERVE O
ene	ND/150	27,000	ND/160	4,000
naphthalene	ND/150	37,000	ND/160	4,000
hylene	ND/150	380	ND/160	100,000
hene	ND/150	370	ND/160	20,000
	ND/150	800	ND/160	400,000
rene	ND/150	2,000	ND/160	100,000
Compounds	ND	ND	ND	N/A
	s natics (mg/Kg) <sup>(1)</sup> Aliphatics Hydrocarbons Aliphatics Hydrocarbons Aromatics Hydrocarbons alytes (ug/Kg) <sup>(1)</sup> ene naphthalene thylene thene rene r Compounds detected at concentrations great applicable. ms per kifogram (mg/Kg) or mi	s 5,400  natics (mg/Kg) <sup>(1)</sup> Aliphatics Hydrocarbons ND/30 Aliphatics Hydrocarbons ND/30 Aromatics Hydrocarbons ND/30 alytes (ug/Kg) <sup>(1)</sup> ene ND/150 naphthalene ND/150 thene ND/150 thene ND/150 trene ND/150	S   5,400   20,000     S   1,300   1,300     Aliphatics Hydrocarbons   ND/30   1,200     Aliphatics Hydrocarbons   ND/30   1,299     Aliphatics Hydrocarbons   ND/30   27,000     Aliphatics Hydrocarbons   ND/150   37,000     Aliphatics Hydrocarbons   ND/150	S

Bold and Shaded = soncentrations above reportable concentrations

Table 2 Concentrations of Volatile Organic Compounds (VOC), Volatile Petroleum Hydrocarbons (VPH), 115 Wayside Avenue West Springfield, Massachusetts and Job # 13997 Extractable Petroleum Hydrocarbons (EPH) in Groundwater Samples (Methods EPA 601, MADEP VPH 97-12, MADEP EPH 98-1) Reportable MW-1 MW-2 MW-3 Sample Location MW-4 Concentrations(2) 7/24/00 and 8/8/00 7/24/00 and 8/8/00 RCGW-2 7/24/00 and 8/8/00 7/24/00 and 8/8/00 Sampling Date Volatile Organic Compounds (µg/L) cis-1,2-dichloroethene BDL/I BDL/I BDL/I BDL/I 30,000 BDL/I Tetrachloroethene 1.4 BDL/1 1.4 3,000 Trichloroethene BDL/I BDL/1 BDL/I BDL/I 300 Volatile Petroleum Hydrocarbons (mg/l)(1) C5-C8 Aliphatics BDL/0.075 BDL/0.075 BDL/0,075 BDL/0.075 1 C9-C12 Aliphatics BDL/0.025 BDL/0.025 BDL/0.025 BDL/0.025 1 BDL/0.025 BDL/0.025 BDL/0.025 C9-C10 Aromatics BDL/0.025 4 Volatile Petroleum Hydrocarbons Analytes (µg/L) BDL/5 BDL/5 BDL/5 Benzene BDL/5 2,000 BDL/5 BDL/5 Ethylbenzene BDL/5 BDL/5 4,000 BDL/S BDL/5 BDL/5 Methyl-tert-butyl ether BDL/5 50,000 Naphthalene BDL/5 BDL/5 BDL/5 BDL/5 6,000 Toluene BDL/5 BDL/5 BDL/5 BDL/5 6,000 m,p-Xylenes BDL/10 BDL/10 BDL/10 BDL/10 6,000(1) BDL/5 o-Xylenes BDL/5 BDL/5 BDL/5 Extractable Petroleum Hydrocarbons (mg/l)(1) C9-C18 Aliphatics BDL/0.2 BDL/0.2 BDL/0.2 BDL/0.2 I C19-C36 Aliphatics BDL/0.2 BDL/0.2 BDL/0.2 BDL/0.2 20 C11-C22 Aromatics BDL/0.2 BDL/0,2 BDL/0.2 BDL/0.2 30 Polycyclic Aromatic Hydrocarbons (ug/l)(1) Naphthalene BDL/5 BDIJ5 BDL/S BDL/5 6,000 2-Methylnaphthalene BDL/5 BDL/5 BDL/5 BDL/5 3,000 Acesaphthene BDL/5 BDL/5 BDL/5 BDL/5 5,000 BDL/5 Acenaphthylene BDL/5 BDL/5 BDL/5 3,000 BDL/5 BDL/S BDL/5 Fluorene BDL/5 3,000 BDL/5 BDL/5 BDL/5 Phenanthrene BDL/5 50 Anthracene BDL/5 BDL/5 BDL/5 BDL/5 3,000 BDL/5 BDL/5 Fluoranthene BDL/5 BDL/5 200 BDL/S BD1/5 BDL/5 BDL/5 3,000 Pyrene BDL/5 BDL/5 BDL/5 Benzo(a)anthracene BDL/5 3,000 Chrysene BDL/5 BDL/5 BDL/5 BDL/5 3,000 Benzo(b)fluoranthene BDL/5 BDL/5 BDL/5 BDL/5 3,000 BDL/5 Benzo(k)fluoranthene BDL/5 BDL/5 BDL/5 3,000 BDL/5 BDL/5 BDL/S BDL/5 3,000 Benzo(a)pyrene BDL/5 BDL/5 BDL/5 BDL/5 3,000 Indeno(1,2,3-od)pyrene Dibenzo(a,h)anthracene BDL/5 BDL/5 BDL/5 BDL/5 3,000 Benzo(g,h,I)perylene BDL/5 BDL/S BDL/5 BDL/5 3,000 NOTES: BDL - Not detected at the practical quantitation limit. N/A= Not Applicable. Milligrams per liter (mg/L) or micrograms per liter (ug/L) as noted. <sup>2</sup>MCP Reportable Concentrations (RCs) pursuant to 310 CMR 40.1600 3 Reportable concentrations for Total Xylenes. Bold and Shaded - concentrations above reportable concentrations.

# Table 3 TPH Results from Post Excavation Soil Samples 115 Wayside Avenue West Springfield, Massachusetts Job # 13997

Sample I.D.	Petroflag (ppm)		
S-1	53*		
S-2	47		
S-3	34*		
S-4	5		
S-5	42		
S-6	167**		
S-7	254**		
S-8	161**		
S-9	1738**		
S-10	BEEE**		
S-11	208**		
S-12	46		
S-13	98*		
S-14	85		
S-15	74		
S-16	120		
S-17	122*		
S-18	181		
S-19	EEEE**		
S-20	311*		
S-21	2089**		
S-22	263		
S-23	294*		
S-24	142*		
S-25	1798(*)**		
S-26	EEEE**		
S-27	149*		
S-28	EEEE**		
S-29	336		
S-30	339		
S-31	30*		
S-32	271*		
S-33	23		
S-34	19		
S-35	48		
S-36	39		
S-37	56*		
S-38	29		
S-39	25		
S-40	41*		

Notes: EEEE = Greater than 2,000 ppm

<sup>\*</sup> Samples submitted for laboratory analysis.

<sup>\*\*</sup> Soils excavated

115Wayside Avenue West Springfield, Massachusetts Job # 15997								Table 4 Concentrations of Volatile Percolum Hydrocarbons (VPH) Extractable Petroleum Hydrocarbons (EPH) (Nethods MADEF VPH 97-12 and MADEF EPH 98-1)	Table 4  Table 4  **Extractable Petroleum Hydrocarbens (VP)  Extractable Petroleum Hydrocarbens (EPH)  for Soil  (Methods MADEF VPH 97-12 and MADEF EPH 98-1)							
Sample Location	Ş-1	\$-3	th-S	5-17	S-20	5-23	5-24	\$-25*	5.27	8-31	\$-32	5.37	\$40		Method I Standards	
Sampling Date	4/24/01	42401	424/01	47401	47491	4/24/01	47401	424/01	4/24/01	4/25/01	4/2501	4/25/01	4/25/01	E-WOVI-S	5-2/GW-3	E-MON-3
Volitale Petroleum Hydrocarbons (mg/kg)	76					Character Construction of the Construction of										
C5-C8 Aliphatics	BDL/0.810	BDI/1.22	BDL:0.810	30U127	BDL-0.960	2.7	BDL/0.690	II.	801/108	BDIJ-0.675	5.9	S16'07'08	BDL/1,05	100	500	500
C9-C17 Alphanes	BDL0.270	BDL/0,405	BDL/0.270	BDU0.425	BD(-0,320	3.8	BDL/0.230	70	BDL:0.350	BDU-0.225	1.4	SOCOJOS	BDL/0,350	1,000	2,500	5,000
C9-C10 Aromatics	BDL/0.270	BDL/0.405	BDL/0.270	BDL/0.425	BDL/0.320	3.9	BDL/0.230	103	BDI-0.350	BDL/0,225	81	SDC-0-305	BDL/0.350	100	500	500
Velatile Petroirum Hydrocarbons Analytes (ug/kg)	Sytes (ug/kg) <sup>(1)</sup>	200				The second second							Carlo			
Benzene	BDU34	18/108	BDL/54	BDUES	BD1/64	BDL/SI	BDU46	BDL/280	BDL/70	BDL/45	BDL/230	BDU61	BDL/38	40,000	50,000	200,000
Ethylbenzene	BDU34	187008	BDL/34	BDL/85	BDL/64	IS/JOB	8DL/46	2,700	BDL/70	BDL/45	BDL/230	BDC-61	BDL/70	300,000	500,000	100,000
Methyl-test-buyl effer	BDL/34	187vdB	BDL/54	BDL/85	BD1.64	BDUST	BDL/46	BDL/280	BDL/70	BDL/45	BDL/230	BDL/61	BD(_/76	100,000	200,000	200,000
Naphrhalene	BDL/34	BDL/\$1	BD0./54	8DL/85	BDL/64	BDUSI	BDU46	1,600	BDI/76	BDL/45	820	BDL/61	BDU70	100,000	100,000	1,000,000
Toluese	BDL/54	BDL/\$1	BDL/54	BDL/85	BDU64	BDL/51	BDL/46	BDL/280	8DL/70	BDL/45	BDL/230	BD(/61	BDL/70	500,000	100,000	2,500,000
m.g. Xylenes	BDL/110	BDL/160	BDL/110	BD1/170	BDL/308	BDL/100	80L/96	10,200	BDL/146	BDL/%	1,800	BD1/126	BDL/140	500,000	100,000	2,500,000
o-Xylenes	BDL/54	BDL/81	BDL/54	BDL/85	BDL/64	BDL/S	BDI./46	1,400	3DL/70	BDL/45	880	BDL/61	BDL/70	500,000	100,000	2,500,000
Extractable Petroleum Hydrocarbons (mg/kg)	(mg/kg) <sup>11</sup>		The second secon					100				7.650-00-00-00-00-00-00-00-00-00-00-00-00-0	AL STREET			
C9-C18 Alighatics	100	BDL70	BDL/30	BDL/40	BDL/40	BDL/40	BDL/30	200	BDL/30	BDL/30	81	BDL/30	BDL/J0	1,000	2,500	5,000
C19-C36 Alliphatics	800/30	80C/30	BDI/30	BDI/40	BDL/40	8DL/40	BDL/30	260	BDL/30	BDL/JO	32	BD1/30	8DL/30	2,500	5,000	5,090
CII-CZZ Aromanes	DETIGE LIFEREN	80000	80030	000040	DULING	BOUAR	90000	272	BDC/30	BULZES	108	SOLUTION	6KAGB	300.	2,000	3,000
Nanhthulane	The state of the s	05.7 MB	DELI NOR	80V 786	901/109	00 L N28	BD1//40	200	OC D AUR	901,140	300	RDI JIDO	RDL/170	000,001	000 0001	000,000
2.Methylnaphthalene	BDL/140	041/10B	BDL/160	981/108	BDL/180	BDL/190	0+1/1GB	9.600	BDL/170	BDL/140	2,200	BDU/130	BDL/100	300,000	1,000,000	1,000,000
Aceraphthene	BDC/140	BDL/176	8DU140	8DL/180	BDL/180	BDL/190	BDI/140	851/210	9C1/10B	BDL/140	8DL/170	BDL/170	801/170	1,000,000	2,500,000	4,000,000
Acemphthylene	BDL/140	001708	9DU140	BDL/180	BDL/180	BDL/190	BDL/140	BDL730	971/10B	0F1/10B	BDL/170	BDUTN	BDU170	100,000	1,000,000	1,000,000
Fluorene	BDC/140	BDU170	BDU140	BDL/180	BDL/180	250	BDL/140	BDL/210	801/170	BDL/140	BDL/130	MI/JOB	90/17/0g	1,000,000	2,000,000	4,900,000
Phenauthrene	BDL/140	BDL/170	001/JOB	BOLVIBO	BDI/180	BDL/190	BD[/140	250	BDL/170	BDL/140	280	BDL/100	0K17/GE	100,000	100,000	100,000
Anthracene	BDL/140	BDU170	BDL/140	BDI/180	BOLVISO	8DL/190	BDL/140	BDL/210	0017100	BDL/140	801/170	80L/199	8DC170	1,000,000	2,500,000	5,000,000
Fluorandiene	BDUTAG	BDL/170	BDL/140	BDL/180	BDL/180	BD1/190	BDL/140	330	80L130	BDC140	801/170	80L/130	BDUTNO	1,000,000	1,000,000	70,00
Ругеле	BDU140	BOL/170	BDL/140	BDL/180	80L/188	720	BD1/140	330	001708	BDL/140	BDL/170	BDL/170	80L130	700,000	2,000,000	5,000,000
Benzo(a)anthracene	BDL/140	BDL/130	BDL/140	BDL/180	BD1/180	BDL/190	BDI/140	BDL/210	BDL/170	BDL/140	BDL/170	BDL/170	801/170	700	1,000	4,000
Chrysene	0+1/10B	BDUJTO	BDL/140	BDI/IGB	BDL-180	BDL/190	BDL/140	BDL/210	BDL/170	BOL/140	BDL/170	BDL/170	8DL/170	7,000	10,000	40,000
Benzo(b)fluorauthene	BDL/140	BDL/J70	BDL/)40	081/108	BDL/180	BDL/190	BDL/140	800/210	DC17/GB	BDI/140	BDL/170	BDL/170	8017108	700	1,000	4,000
Benzo(k)fluoranthene	BD1/140	BDL/J70	BDU740	EDL/180	0817108	BD1/190	DP1/108	BDL/210	80L/170	BDI/140	BDU170	977708	BDL/170	3,000	10,000	40,000
Benzo(a)pyrene	OBITION OF	WINGS	OPI CAR	BELIEB	000,000	BD 000	Del God	012700	MINGE	DOL/140	9717708	BDC 070	0/1/00	700	000	0.000
Indeno(),2,3-cd/pyrene	8DL/140	80U10	801/100	BDL/300	081/108	BD17190	SPLOGS	BONZIO	0717JQ8	800140	BDL170	800770	BDC170	700	1,000	4,000
Dibenzo(a,h)anthracene	BDL/140	BDL/170	BDL/140	BDL/180	861/188	8DU198	BDL/140	BDL/210	041/1GB	BDL/140	BDL/170	BDL/170	BDC/170	700	700	300.0
Bearo(g,h,l)perylene	BDL/140	BDU170	BDL/140	BDL/180	BDL/180	BDU190	BDU140	BDL/210	BDL/170	BDL/140	BDL/170	BDL/170	BDC/170	1,000,000	2,500,000	2,500,000
NOTES: BDL & Below practical quantitation limits NAW Not Applicated For	blation limits.															
NS - No Standard													-			
Milligrams per kilognems (mg/Kg) or micrograms per kilograms (ug/Kg) as noted.	e/Kg) or micrograms per kil	ograms (ug/Kg) as noted.														
MCP Method I Soil Standards from Table 2, 310 CMR 40,0975 (6)(a).	is from Table 2, 310 CMR 4	(0.0975 (6)(a)											7.7			
Standard for Toral Xylenes.													10			
*Standard for Total PCBs.																
A real man a real real real real real real real re																

Reportable Concentrations <sup>(2)</sup> RCGW-2  30,000 3,000 300  1 1 4 2,000 4,000 50,000 6,000 6,000 6,000 6,000 6,000 1 1 20 30	Method 1 Standards <sup>(0)</sup> GW-3  50,000  5,000  20,000  4  20  4  7,000  4,000  50,000  6,000  50,000  50,000  40  20  20  20
30,000 3,000 300  1 1 4 2,000 4,000 50,000 6,000 6,000 6,000 6,000 6,000 6,000 61,000 63	\$0,000 \$,000 20,000 4 20 4 7,000 4,000 50,000 6,000 50,000 50,000
3,000 300  1 1 4 2,000 4,000 50,000 6,000 6,000 6,000 6,000 6,000 6,000 1 1 20	5,000 20,000  4 20 4 7,000 4,000 50,000 6,000 50,000 50,000 4,000 20 20
3,000 300  1 1 4 2,000 4,000 50,000 6,000 6,000 6,000 6,000 6,000 6,000 1 1 20	5,000 20,000  4 20 4 7,000 4,000 50,000 6,000 50,000 50,000 4,000 20 20
300  1 1 4 2,000 4,000 50,000 6,000 6,000 6,000 6,000 6,000 1 20	20,000  4  20  4  7,000  4,000  50,000  50,000  50,000  20  20
2,000 4,000 50,000 6,000 6,000 6,000 <sup>(3)</sup> 6,000 <sup>(3)</sup>	4 20 4 7,000 4,000 50,000 6,000 50,000 50,000
1 4 2,000 4,000 50,000 6,000 6,000 6,000 <sup>(3)</sup> 6,000 <sup>(3)</sup>	20 4 7,000 4,000 50,000 6,000 50,000 50,000 <sup>49</sup> 20 20
1 4 2,000 4,000 50,000 6,000 6,000 6,000 <sup>(3)</sup> 6,000 <sup>(3)</sup>	20 4 7,000 4,000 50,000 6,000 50,000 50,000 <sup>49</sup> 20 20
4  2,000  4,000  50,000  6,000  6,000  6,000  6,000  1  20	7,000 4,000 50,000 6,000 50,000 50,000 <sup>(4)</sup>
2,000 4,000 50,000 6,000 6,000 6,000 <sup>(3)</sup> 6,000 <sup>(3)</sup>	7,000 4,000 50,000 6,000 50,000 50,000 <sup>(4)</sup>
4,000 50,000 6,000 6,000 6,000 <sup>(3)</sup> 6,000 <sup>(3)</sup>	4,000 50,000 6,000 50,000 50,000 <sup>(4)</sup>
4,000 50,000 6,000 6,000 6,000 <sup>(3)</sup> 6,000 <sup>(3)</sup>	4,000 50,000 6,000 50,000 50,000 <sup>(4)</sup>
4,000 50,000 6,000 6,000 6,000 <sup>(3)</sup> 6,000 <sup>(3)</sup>	4,000 50,000 6,000 50,000 50,000 <sup>(4)</sup>
50,000 6,000 6,000 6,000 <sup>(3)</sup> 6,000 <sup>(3)</sup>	50,000 6,000 50,000 50,000 <sup>(4)</sup> 20 20
6,000 6,000 6,000 <sup>(3)</sup> 6,000 <sup>(3)</sup>	6,000 50,000 50,000 <sup>(4)</sup> 20 20
6,000 <sup>G3</sup> 6,000 <sup>G3</sup> 1 20	50,000 <sup>(4)</sup> 20 20
6,000 <sup>GJ</sup>	50,000 <sup>(4)</sup> 20 20
1 20	20 20
1 20	20
20	20
20	
20	30
	11997
6,000	6,000
3,000	3,000
5,000	5,000
3,000	3,000
3,000	3,000
50	50
3,000	3,000
200	200
3,000	3,000
3,000	3,000
3,000	3,000
3,000	3,000
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3,000	3,000
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	3,000 3,000 3,000 3,000 3,000 3,000 3,000 3,000

West	115Wayside Avenue			Table 6		
2	Test opringilent, Massachusetts Job # 13997			Exposure roint Concentration for Soil	12	10 CONT. 10 CO.
57	Sample Location	8-23	S-32	Exposure Point	Method 1	Standards
	Sampling Date	4/24/01	4/25/01	Concentrations	S-1/GW-3	S-3/GW-3
Volitale	Volitale Petroleum Hydrocarbons (mg/kg)()	(t)(B				1976
	C5-C8 Aliphatics	2.7	5.9	5.9	100	200
	C9-C12 Aliphatics	3.8	14	14	1,000	2,000
	C9-C10 Aromatics	3.9	18	18	100	200
'olatile	Volatile Petroleum Hydrocarbons Analytes (µg/kg)(1)	tes (µg/kg) <sup>(1)</sup>				
	Naphthalene	BDL/51	820	820	100,000	1,000,000
	m,p-Xylenes	BDL/100	1,800	1,800	200,000	2,500,000
	o-Xylenes	BDL/S1	880	880	200,000	2,500,000
xfract	Extractable Petroleum Hydrocarbons (mg/kg)(1)	ng/kg) <sup>(1)</sup>			TO SECURE OF THE PARTY OF THE P	
	C9-C18 Aliphatics	BDL/40	18	81	1,000	2,000
	C19-C36 Aliphatics	BDL/40	32	32	2,500	2,000
	C11-C22 Aromatics	BDL/40	104	104	800	5,000
olynuc	Polynuclear Aromatic Hydrocarbons(µg/Kg)(1)					
	Naphthalene	BDL/190	720	72	100,000	1,000,000
	2-Methyinaphthalene	BDL/190	2,200	2,200	200,000	1,000,000
-	Fluorene	250	BDL/170	250	1,000,000	4,000,000
	Phenanthrene	BDL/190	280	280	100,000	100,000
	Pyrene	220	BDL/170	220	700,000	5,000,000
NOTES:	BDL = Below practical quantitation limits.  NA= Not Analyzed For.  NS = No Standard	tion limits.				
	<sup>1</sup> Milligrams per kilograms (mg/Kg) or micrograms per kilograms (ug/Kg) as noted.	g) or micrograms per kilog	rams (ug/Kg) as noted.			
	<sup>2</sup> MCP Method 1 Soil Standards from Table 2, 310 CMR 40.0975 (6)(a)	rom Table 2, 310 CMR 40.	0975 (6)(a).			
	3Standard for Total Xylenes,					
	*Standard for Total PCBs.		62			
	Area was excavated					
	Bold = Concentrations Above Standards.	indards.				

	115 Wayside Avenue	a	Table 7
	West Springfield, Massachusetts	Exposure Poir	Exposure Point Concentrations for Groundwater Samples in Collected from Well MW-1
	Sample Location	MW-1	Method I Standards(3)
	Sampling Date		GW-3
Volatile	Volatile Organic Compounds (µg/L) <sup>(1)</sup>		
	1, 1, 1-trichloroethane	88	20,000
	Tetrachloroethene	1.7	5,000
NOTES:	BDL = Below practical quantitation limits.  NA= Not Analyzed For.  Milligrams per liter (mg/L) or micrograms per liter (ug/L) as noted.  MCP Method 1 Groundwater Standards from Table 1, 310 CMR 40.0974(2).  Standard for Total Xylenes.	ts. ams per liter (ug/L) as noted. is from Table 1, 310 CMR 40.0974(2	
	Bold = concentrations above standards.		

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	Ta	Table 7	
West Springfield, Massachusetts	Exposure Poin	Exposure Point Concentrations	
Job # 13997	for Groundwater Samples i	for Groundwater Samples in Collected from Well MW-2	
Sample Location	MW-2	Method I Standards <sup>(3)</sup>	
Sampling Date	7/24/00 or 5/9/01	GW-3	
Volatile Organic Compounds (µg/L) <sup>(1)</sup>	TOTAL SECTION AND		
1,1,1-trichloroethane	72.5	50,000	
Tetrachloroethene	11	2,000	
1,1-Dichloroethane	34	50,000	
1,1-Dichloroethene	13	80,000	
Trichloroethene	3.1	20,000	100
cis-1,2-dichloroethene	9.2	900'05	
NOTES: BDL - Below practical quantitation limits	limits.		
NA= Not Analyzed For.			
'Milligrams per liter (mg/L) or micrograms per liter (ug/L) as noted.	rograms per liter (ug/L) as noted.		
<sup>3</sup> MCP Method 1 Groundwater Star	<sup>3</sup> MCP Method 1 Groundwater Standards from Table 1, 310 CMR 40.0974(2).		
Standard for Total Xylenes.			
Bold = concentrations above standards	rds.		

115 Wayside Avenue	Ta	Table 7
West Springfield, Massachusetts Job # 13997	Exposure Poin for Groundwater Samples	Exposure Point Concentrations for Groundwater Samples in Collected from Well MW-3
Sample Location	MW-3	Method 1 Standards <sup>(3)</sup>
Sampling Date	7/24/00 or 5/9/01	GW-3
Volatile Organic Compounds (µg/L.) <sup>(1)</sup>		
1,1,1-trichloroethane	725	80,000
Tetrachloroethene	п	8,000
I,I-Dichloroethane	34	80,000
1,1-Dichloroethene	13	20,000
Volatile Petroleum Hydrocarbons Analytes (µg/L)	нg/L) <sup>(1)</sup>	
Methyl-tert-butyl ether	3.2	50,000
NOTES: BDL = Below practical quantitation limits.  NA= Not Analyzed For.  Milligrams per liter (mg/L) or micrograms per liter (ug/L) as noted.  McP Method I Groundwater Standards from Table 1, 310 CMR 40	DL = Below practical quantitation limits.  NA= Not Analyzed For.  Milligrams per liter (mg/L) or micrograms per liter (ug/L) as noted.  MCP Method I Groundwater Standards from Table 1, 310 CMR 40.0974(2).	
Standard for Total Xylenes. Bold – concentrations above standards.	īds.	

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	115 Wayside Avenue		Table 7
	West Springfield, Massachusetts	Exposure Po	Exposure Point Concentrations
	Job # 13997	for Groundwater Sample	for Groundwater Samples in Collected from Well MW-4
1	Sample Location	MW-4	Method 1 Standards <sup>(3)</sup>
8	Sampling Date		GW-3
Volatile	Volatile Organic Compounds (µg/L) <sup>(1)</sup>		
	1,1,1-trichloroethane	725	20,000
	Tetrachloroethene	11	2,000
	I, I-Dichloroethane	34	50,000
	1,1-Dichloroethene	13	30,000
NOTES	BDL - Below practical quantitation limits.	its.	
	NA= Not Analyzed For.		
	'Milligrams per liter (mg/L) or micrograms per liter (ug/L) as noted.	rams per liter (ug/L) as noted.	
	<sup>3</sup> MCP Method 1 Groundwater Standards from Table 1, 310 CMR 40.0974(2).	ds from Table 1, 310 CMR 40.0974	(2).
	*Standard for Total Xylenes.		
	Rold = concentrations shove standards		

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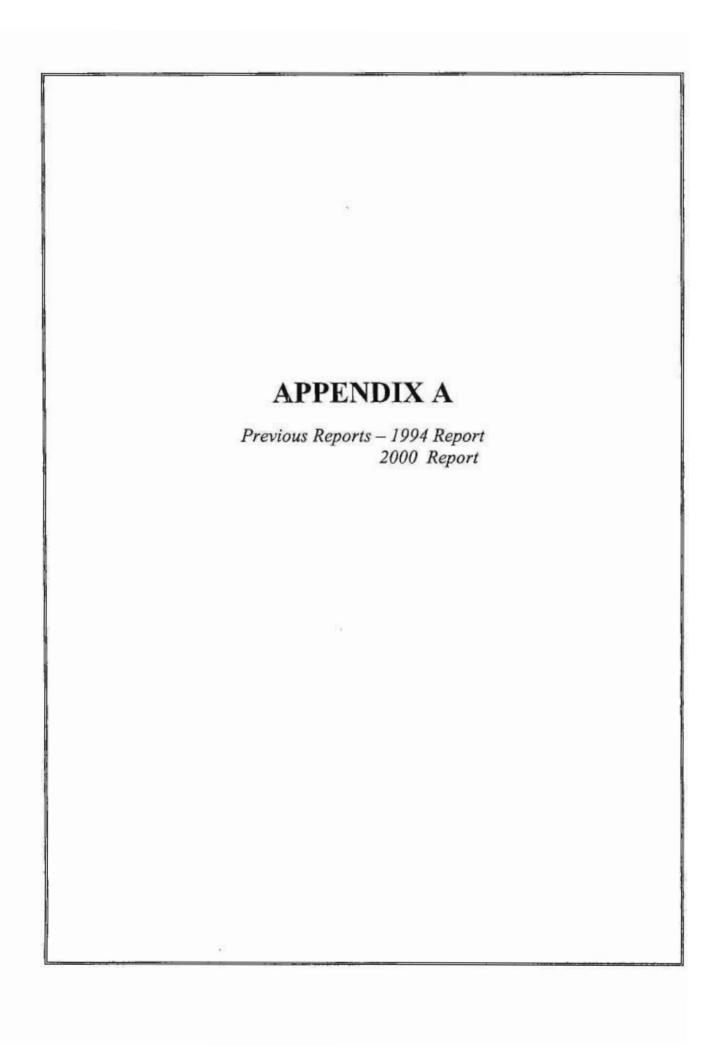
A

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U

115 Wayside Avenue		Table 7
West Springfield, Massachusetts Job # 13997	Exposure Po	Exposure Point Concentrations for Groundwater Samples in Collected from Well MW-5
Sample Location	MW-5	Method 1 Standards <sup>(3)</sup>
Sampling Date	2000	GW-3
Volatile Organic Compounds (µg/L) <sup>(1)</sup>		
1,1,1-trichloroethane	09	20,000
trans-1,2-dichloroethylene	\$9	50,000
Trichloroethene	85	20,000
Tetrachloroethene	7.8	2,000
1,1-Dichloroethane	13	20,000
NOTES: BDL = Below practical quantitation limits.	.53	
NA-Not Analyzed For.		
'Milligrams per liter (mg/L) or micrograms per liter (ug/L) as noted.	ams per liter (ug/L) as noted.	
<sup>3</sup> MCP Method 1 Groundwater Standards from Table 1, 310 CMR 40.0974(2).	s from Table 1, 310 CMR 40.0974	(2).
Standard for Total Xylenes.		
Bold = concentrations above standards.		





## ENVIRONMENTAL COMPLIANCE SERVICES, INC.

## ENVIRONMENTAL SITE ASSESSMENT 115 WAYSIDE AVENUE WEST SPRINGFIELD, MASSACHUSETTS

# Prepared For:

Mr. Richard Gagnon Commercial Disposal Co., Inc. 115 Wayside Avenue West Springfield, Massachusetts 01090

# For Use By:

Park WestBank & Trust Company 225 Park Avenue West Springfield, Massachusetts 01089

## Prepared By:

Environmental Compliance Services, Inc. 588 Silver Street Agawam, Massachusetts 01001

> File No. 12142A.21E Document No. 8585 September, 1994



# ENVIRONMENTAL COMPLIANCE SERVICES, INC.

September 29, 1994 File No. 12142.00 Document No. 8585

Mr. Richard Gagnon Commercial Disposal Co., Inc. 115 Wayside Avenue West Springfield, MA 01060

RE:

Environmental Site Assessment

Commercial Disposal 115 Wayside Avenue

West Springfield, Massachusetts

Dear Mr. Gagnon:

Environmental Compliance Services, Inc. (ECS) has completed an Environmental Site Assessment of the commercial property currently operated as Commercial Disposal, located at 115 WaySide Avenue in West Springfield, Massachusetts (the site) (Figure 1, Site Locus). This assessment included: background research at the West Springfield City Offices, West Springfield Fire Department; a review of state and federal environmental databases and files regarding the site and surrounding properties; review of available documentation regarding closure of the site as a Resource Conservation and Recovery Act (RCRA) Transfer, Disposal, Storage Facility (TSDF); and groundwater sampling and analyses. The purpose of this assessment was to render an opinion as to the presence of oil and/or hazardous materials at the site within the provisions of Massachusetts General Laws (MGL) Chapter 21E and the applicable implementing regulations, the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000.

The research portion of the assessment is presented as Attachment I to this letter. The Site Locus and Site Plan are included as Figure 1 and Figure 2, respectively. A summary of previous and current groundwater analyses and reportable concentrations are presented on Table I. The reports of laboratory analysis for groundwater samples are included as Attachment III. A summary of the findings of the assessment, as well as conclusions and recommendations, are presented within.



Page 2

#### 1.00 - SUMMARY

## 1.10 - Location Description and Setting

The site consists of approximately 2.13 acres of land located approximately 750 feet west of the Connecticut River at the intersection of Wayside Avenue and Town Way in West Springfield, Massachusetts (the site) (Site Locus, Figure 1). The property is listed at the West Springfield Assessor's Office as Parcel Code 499 on Map 81, owned by Commercial Disposal Co., Inc. The site is located in a commercial and industrial area with some residential properties located in the vicinity of the site.

The present building, consisting of approximately 14,100 square feet of floor space, is currently used for an office, warehouse and repair garage for Commercial Disposal. Utilities available on the site include natural gas, electrical and telephone services, and municipal sanitary sewer and drinking water supply. Surface drainage flows either to a storm drain on-site and abutting roadways toward a drainage pipe that discharges to the north of the site parking areas or into a Connecticut River overflow detention basin located to the north of the site.

Abutting properties include: Capital Insulation to the west; West Springfield flood control property to the north; Bearings Specialty Co., Northeast Precision and K-Link Rigging Products and a residential house located to the south; and Town Way located to the east (Site Plan, Figure 2).

The topography of the site slopes gently from the west down towards the east. A topographic depression associated with a Connecticut River Overflow basin is located directly to the northeast of the site.

#### 1.20 - History of Development

According to available historical records at the City of West Springfield Library, the site has housed Commercial Disposal since the mid 1980s. Prior to that time the site was occupied by Capital Insulation in the 1970s and New England Roto engraving in the 1960s and 1970s. The easterly portion of the site along Town Way formerly supported Legers Rubbish Removal Corp. Division of Waste Management in the 1960s and 1970s. No on-site development was documented prior to the 1960s.



#### Page 3

The area of the site was developed for residential use prior to 1930 and remained residential in nature until the 1950s. The southerly abutter at 121 and 123 Wayside Avenue remains as a residential property. Other properties abutting the site have supported commercial and industrial businesses since the 1950s.

## 1.30 - Regulatory Information

#### 1.31 - On-Site

A review of Western Regional Office of the Massachusetts Department of Environmental Protection (DEP), City of West Springfield Fire Department, and West Springfield City Clerk's Office records revealed the following information:

 The site was formerly a Transport, Storage or Disposal Facility (TSDF) as defined by 310 CMR 30.00 Resource Conservation and Recovery Act (RCRA). Storage of hazardous waste on the site was discontinued in 1987.

The facility underwent a RCRA closure study performed by HRP Associates Inc. of Plainville Connecticut. Based on the study a closure certification and change of status form were filed by Commercial Disposal in July 1993. The closure study included the removal of above ground hazardous waste storage tanks and removal of soil from a hazardous waste drum storage area. This area is designated as a previously excavated area on the Site Plan, Figure 2. Groundwater monitoring wells were installed on the site and groundwater samples were obtained for quantitative analyses. Several chlorinated solvents were detected in groundwater on the site.

On January 25, 1994 a letter indicating that the closure satisfied the requirements of 310 CMR 30.587 was issued by the Massachusetts Department of Environmental Protection, Boston, Massachusetts. The letter indicated that no post closure requirements were imposed by the DEP. Groundwater contamination, however, was detected on the site and the letter indicated that the groundwater contamination should be compared to the standards of the Massachusetts Contingency Plan 310 CMR 40.0000.

 The site is not listed on the U.S. EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list, or on the DEP's List of Confirmed Disposal Sites or Locations to be Investigated (LTBI).



#### Page 4

- The site is a small quantity generator of waste oil. According to a May 24, 1993 Compliance Inspection of the site, a waste oil space heater is permitted for use to burn up to 2,000 gallons of waste oil per year on the site. Approximately 1,650 gallons of waste oil were burner on site for heating. The waste oil material is stored in a 250-gallon above ground storage tank. According to the file two parts cleaners are used on site and utilize naphtha for cleaning solvent. No floor drains or waste water discharges were noted in the area of the waste oil burner.
- Emergency Response incident reports regarding the site indicate that approximately 30 gallons of diesel fuel was spilled at the site on December 1, 1992. The spill was cleaned by Oil Recovery of West Springfield, MA. The DEP closed this case on December 4, 1992. On July 22, 1993, 20 to 50 gallons of hydraulic oil was released to the site from a hydraulic line on a dump truck. The file indicates that approximately 1.73 tons of absorbent material was used to cleanup this spill. Also, on October 21, 1994, approximately 3 gallons of fuel oil was spilled from an oil delivery truck and on April 30 1986 approximate 5 gallons of diesel was spilled during an overfill of a storage tank. These spills were covered with absorbent and cleaned up by Commercial Disposal.
- One 10,000 gallon underground storage tank on the site failed a tank test in April 1986. The tank was retested and passed the second tank test. The failure of the testing was attributed to an air pressure loss from a manhole which had not been considered.
- Fire department records indicate that the site is currently equipped with (2) 1,000 gallon and (1) 10,000 gallon underground storage tanks. The 1,000 gallon tanks contain hydraulic oil and lubricating oil and the 10,000 gallon tank contains diesel fuel. These tanks were installed in 1989. Tanks with an approximately capacity of 14,000 gallons were removed from the site in 1988 and 1989. No indication of a release from these tanks was noted in fire department files.
- A review of the DEP/Mass GIS Map for Natural Resources/Western Region indicated that the site and vicinity are mapped as an area underlain by a medium-yield aquifer which is considered potentially productive. No public water supply is located in the vicinity of the site.



Page 5

## 1.32 - Off-Site

There are no locations within a one-mile radius of the site which appear on the USEPA CERCLIS list.

There are two locations in the immediate vicinity of the site that are on the DEP's Confirmed Disposal Sites/LTBI List. Former Sanford Tool at 79 Wayside Avenue and property located at 35 Doty Circle both located approximately 200 feet west of the site. (Attachment I).

The file for Sanford Tool indicates that groundwater flow is toward the north at this site. Groundwater sample analyses for downgradient monitoring wells on the north side of the site indicate the presence of chlorinated solvents (1,1,1-trichloroethane and trichloroethylene) in groundwater.

Leaking underground storage tank incidents have occurred at the UPS facility to the south of the site across Wayside Avenue and at 124 Ashley Avenue which is approximately 0.3 of a mile to the south of the site. No emergency response incidents were indicated on abutting sites. The UPS facility across Wayside Avenue had a release to floor drains on there property which discharged to the Connecticut River (Attachment I).

Brinks at 35 Doty Circle, Standard Industrial Supply 154 Wayside Avenue and UPS at 120 Wayside Avenue have been licensed for underground storage tanks.

## 1.40 - Site Visit

Site visits were performed by Mr. Glenn Riddle of ECS on August 2, and 29, 1994.

Mr. Don LaFerriere, Operations Manager was present to answer questions concerning the property and buildings. The following general observations were made during the site visit:

The on-site buildings are comprised of a one-story concrete block office building and a one-story maintenance garage building. The site buildings house Commercial Disposal Offices and the garage building is utilized by both Commercial Disposal and Oil Recovery for maintenance of vehicles. Trucks associated with the solid waste transporting are parked on the northeastern portion of the site.



#### Page 6

- A paved parking area is located to the east of the office building and the majority of the site is either paved or covered by buildings.
- The current heating method utilized for the office building is natural gas. Natural gas is also used to fuel the heating system in the garage building and is supplemented by a waste oil burning heater for which the DEP has issued a permit. According to Mr. Richard Gagnon no hazardous waste is generated on the site. Waste oil generated from the maintenance of vehicles on the site is stored and burned in bay 4 as depicted on the site plan, Figure 2.
- Oils and hazardous materials related to the businesses are stored on site inside
  the building area (Attachment I). Sanitary waste generated on the site is
  discharged to the municipal sewer system. According to Commercial Disposal,
  waste water discharged to floor drains within the site building is discharged to
  an oil/water separator which is connected to the municipal sewer system.

## 2.00 - FIELD INVESTIGATIONS

#### 2.10 - Investigatory Approach

Four of five groundwater monitoring wells located on or near the site were accessed, sampled and samples were analyzed to evaluate the potential presence of oil or hazardous material in the environment of the site. A fifth monitoring well designated MW-5 could not be located by ECS. Previous investigation indicate that these sampling locations are downgradient to potential sources of oil or hazardous material on the site. The locations of monitoring wells were approximated from available information on the Site Plan, Figure 2.

#### 2.20 - Methodology

SULC

## 2.22 - Groundwater Sampling

On August 9, 1994, monitoring wells were gauged for depth to water and total depth using a decontaminated electronic water level indicator. The volume of standing water in each well was calculated and between five and six well volumes of groundwater were purged from each well using pre-cleaned stainless steel bailers suspended with virgin polypropylene rope. Groundwater samples were collected in duplicate 40 milliliter (ml) teflon-septa vials for VOC analysis by EPA Method 624, and in one liter glass containers for TPH analysis by GC via EPA Method 8100. These analyses were selected due to the current property uses. Samples collected for VOC



## Page 7

6.32 GW/

and TPH analyses were preserved with concentrated hydrochloric acid to achieve a pH less than 2 in the sample. All samples were refrigerated on-site and during transport to a Massachusetts-certified laboratory following chain of custody protocol.

A sample from each monitoring well was collected for on-site measurement of temperature, pH, and specific conductance, and to permit observation of pertinent characteristics such as the presence of an odor or a sheen.

## 2.30 - Results and Discussion

## 2.31 - Groundwater Quality

As presented in Table 1 no total petroleum hydrocarbons were detected in the groundwater samples collected from wells MW-2 through MW-5. Volatile organic compounds were detected in each of the remaining monitoring wells. The site is in an area designated as GW-1: a potentially productive aquifer. Concentrations of volatile organic compounds which exceed reporting category GW1 are present only in monitoring wells MW-2, -4, and -5. Only tetrachloroethylene is present in concentrations which exceed the reporting category.

During sampling a slight petroleum odor was noted in the sample from well MW-2. Laboratory analyses indicate that trace concentrations of petroleum constituents are present.

#### 3.00 - CONCLUSIONS

## 3.10 - Conclusions

During this environmental site assessment, no evaluation of the presence of lead paint, urea formaldehyde foam insulation, or asbestos-containing materials was performed on the site. A limited program of groundwater sampling and analyses was performed on the site to assess the condition of the site with respect to oil or hazardous material. Groundwater samples were obtained from monitoring wells installed by others as part of a previous study. The conclusions made in this report are limited according to these qualifications, and the limitations presented as Attachment IV.

Based on the information obtained during this assessment, it is the opinion of ECS that groundwater contamination is present on the site. The concentrations of groundwater contamination are relatively low but do exceed the concentration for reporting for the site area



Page 8

at one well location. The use of the site as a RCRA storage and transport facility required closure of the site after these operations ceased. Subsequent studies of the site have fulfilled the closure requirements, however, the groundwater contamination on the site must be compared to the standards presented in the Massachusetts Contingency Plan 310 CMR 40.0000. As noted above, these groundwater standards are exceeded at the site. However, the concentrations of these constituents in groundwater are not likely to warrant remediation. of the site.

The area of the site has supported many industrial properties which have utilized oil and hazardous materials. The current use of the site does not suggest that the presence of chlorinated solvents is associated with current on-site activity. A near-by property, former Sanford Tool, to the west of the site also has contaminated groundwater. Groundwater flow at this facility does not indicate that this site is downgradient from the former Sanford Tool facility. In addition, the contaminant which exceeds groundwater standards on the site, Tetrachloroethylene, is not present at the former Sanford Tool site.

Therefore, the source of the reportable concentration of contamination on the site has not been identified.

If there are any questions concerning this information, please do not hesitate to contact our office.

Sincerely,

ENVIRONMENTAL COMPLIANCE SERVICES, INC.

Richard A. Starodoj Environmental Analyst

Glenn A Riddle (our

Glenn D. Riddle

Senior Project Manager

RAS/GDR/im Attachments

# Table 1 Quantitative Analyses of Groundwater Commercial Disposal West Springfield, Massachusetts

CONSTITUENT (µG/L)	DATE	MW-1	MW-2	MW-3	MW-4	MW-5	GW-1 STANDARD µG/L
TPH	8/9/94	NT	BDL	BDL	BDL	BDL	NA
MTBE .	8/9/94	NT	BDL	3.2	BDL	BDL	700
Benzene	8/9/94	NT	3.3	BDL	BDL	BDL	5.0
o-Xylene	8/9/94	NT	6.7	BDL	BDL	BDL	6,000
1,1,1- Trichloro ethane	11/3/89 10/23/90 4/12/91 8/9/94	88 BDL BDL NT	109 1.0 BDL 1.3	90 7.0 6.0 3.4	725 40 1.0 6.5	60 2.0 BDL BDL	200
T-1,2-Dichloro ethylene	11/3/89 10/23/90 4/12/91 8/9/94	BDL BDL BDL NT	BDL BDL BDL BDL	BDL BDL BDL BDL	BDL BDL BDL BDL	65 27 10 BDL	100
Trichloro ethylene	11/3/89 10/23/90 4/12/91 8/9/94	BDL BDL BDL NT	BDL BDL BDL BDL	BDL BDL BDL BDL	BDL BDL BDL BDL	26 58 14 9.5	5.0
Tetrachloroet hylene	11/3/89 10/23/90 4/12/91 8/9/94	17 BDL BDL NT	11 BDL BDL 5.4	11 BDL 2 2.8	BDL BDL BDL 11	78 26 12 34	5.0
1,1-Dichloro ethane	11/3/89 10/23/90 4/12/91 8/9/94	BDL BDL BDL NT	BDL BDL BDL BDL	BDL BDL BDL BDL	34 BDL BDL BDL	11 BDL BDL 1.4	70
1,1-Dichloro ethylene	11/3/89 10/23/90 4/12/91 8/9/94	BDL BDL BDL NT	BDL BDL BDL BDL	BDL BDL BDL BDL	13 BDL BDL BDL	BDL BDL BDL BDL	1.0

Notes:

TPH = Total Petroleum Hydrocarbons

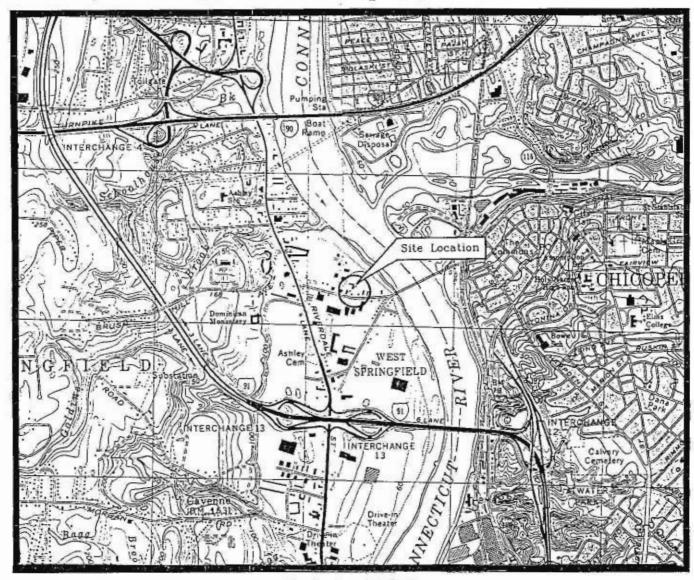
MTBE = Methyl-t-Butyl Ether  $\mu$ g/L = micrograms per liter BDL = Below Detection Limit

NT = Not Tested (Well could not be located).



# ENVIRONMENTAL COMPLIANCE SERVICES, INC.

588 Silver Street \* Agawam, MA 01001



Scale 1: 25,000

1 1/2 0 1 Mile

Contour Interval 10 Feet

Base Map: U.S. Geological Survey; Quadrangle Location: Springfield North, Massachusetts

Map Edited: 1972 Photorevised: 1979 Photoinspected: None

North

Commercial Disposal Co., Inc.

115 Wayside Avenue West Springfield, Massachusetts

AutoCAD File: LOC.DWG

Site Locus

Job No.: 12142.00

September 1994

Figure - 1

# ADMINISTRATIVE INFORMATION PROJECT NUMBER: 12142A.21E DATE COMPLETED: September 29, 1994 August 2, 1994 DATE STARTED: CUENT: Commercial Disposal Commercial Disposal ADDRESS: CUENT ADDRESS: 115 Wayside Avenue 115 Wayside Avenue and 17 Town Way, West Springfield, Massachusetts CLIENT CONTACT: Mr. Richard Gagnon CONTACT ON SITE: Mr. PHONE: (413) 737-1129 PHONE: (413) 737-1129 CLIENT FILE NO. CONTENTS OF ASSESSMENT: COUNTY: Hampden SECTION 1 - SITE LOCATION & SETTING STATE: Massachusetts SECTION 2 - LOCAL RECORDS REVIEW AND INTERVIEWS WITH LOCAL OFFICIALS NEAREST INTERSECTION / CROSS STREET: SECTION 3 - LOCAL HISTORY SECTION 4 - FEDERAL ENVIRONMENTAL RECORDS Wayside Avenue and Doty Circle SECTION 5 - STATE ENVIRONMENTAL RECORDS SECTION 6 - SITE VISIT CONFIDENTIALITY: Standard MISCELLANEOUS ADDITIONAL INFORMATION:

Copyright 1992 Environmental Compliance Services, Inc.

#### SITE LOCATION

USGS QUADRANGLE MAP:

Springfield-North

LATITUDE:

42°08'37"

LONGITUDE:

72°37'28"

UTM COORDINATES:

468775N

696325E

#### LOCATION OF SITE RELATIVE TO LANDMARKS:

The site is located approximately 2,900 feet north of the Route 91, Route 5 interchange in West Springfield and about 750 feet west of the Connecticut River.

#### SITE SETTING

#### REGIONAL DEVELOPMENT:

The area to the northwest, west, south and southeast is primarily associated with light industrial and commercial enterprises. The area to the north and northeast contain flood control dikes and stormwater pump stations.

#### REGIONAL TOPOGRAPHY:

Regional topography is flat, given the areas location in the Connecticut River Flood Plain.

#### **ELEVATIONS:**

Based on USGS Topographical Maps, the area is at an approximate elevation of 60 mean sea level with the Connecticut River being at approximately 49 feet.

#### REGIONAL DRAINAGE:

Storm runoff in this area is collected by sewer and is charged into the Connecticut River at the end of Wayside Avenue.

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#### SURFACE WATER:

## Surface Water On-site:

No surface water bodies are located on site.

## Surface Water Adjacent to the site:

No surface water is located adjacent to the site.

Note: A stormwater detention area just over the northern border is normally dry, except in extreme storm events.

#### WETLANDS

## Wetlands On-site:

None indicated.

## Wetlands Adjacent to the Site:

None indicated.

#### WETLANDS INVENTORY MAPS:

Name of Map: Springfield-North, Mt. Tom

Date:

October, 1975

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## FLOODING POTENTIAL:

ON AND IN THE VICINITY OF THE SITE:

The site is located in the Connecticut River Flood Plain. However, it is protected by an extensive series of dike built by the Army Corps of Engineers in the late 1930s and early 1940s.

FLOOD INSURANCE RATE MAP (FIRM):

FIRM Maps were not reviewed as part of the present assessment.

## SITE GEOLOGY:

SOILS:

#### Classification:

UH - Urban Land Hadley Winooski Association

#### Characteristics:

Soils are deep and moderately drained, slopes are 0 to 8 percent. Surface layer is friable, dark gray-brown loam for 12 inches. Substratum is to a depth of 60 inches. Alternating layers of olive silt and find sand with gray and yellow-red mottles. Permeability is high, as is water capacity.

## Information Source:

Sheet 17, Page 52 - USDA Soil Conservation Service, Soil Survey of Hampden County, Central Part, issued May of 1978.

#### SURFICIAL GEOLOGY:

Sand deposits and fine deposits, undifferentiated.

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## Estimated Thickness:

Unknown.

## Information Source:

Map showing distribution and thickness of the principal fine graine deposits, Connecticut Valley Urban Area, Central New England, by William H. Langer, Map I-1074-C, Sheet 2 of 2.

#### BEDROCK GEOLOGY:

Hartford Basin, Portland Formation (Lower Jurassic). Reddish-brown to pale red arkose and siltstone, and gray sandstone, gray siltstone, and black shale interpreted as lake beds.

#### Description:

#### Information Source:

Bedrock Geologic Map of Massachusetts, E-an, Zen, Editor, 1983.

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Local Records Review and Interviews

With Local Officials

Project Number 12142A.21E September 29, 1994 Page 6

ASSESSORS	OFFICE:
-----------	---------

Contact:

Date:

Time:

Staff/Ms. Croteau

September 27, 1994 10:15 - 11:00 am

PRESENT OWNER OF RECORD:

Commercial Disposal Company, Inc.

DATE OF PURCHASE:

Not Specified

LISTED ADDRESS:

195 Wayside Avenue

West Springfield, Massachusetts 01089

MAP AND PARCEL NUMBER(S):

Map 81, Parcel 499

DEED BOOK AND PAGE:

5614/80

AREA:

2.13 Acres in Parcels

HEAT SOURCE:

Gas forced hot air.

UTILITY SERVICES ON-SITE:

Gas, electricity, sewer, telephone, and water.

Notes:

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Local Records Review and Interviews

With Local Officials

Project Number 12142A.21E September 29, 1994 Page 7

•	ASSESSOR'S OFFICE INFORMA	NOIT	
	BUILDINGS OR STRUCTURES ON	SITE	
LOCATION	CONSTRUCTION	NUMBER OF FLOORS	AREA (SQUARE FEET)
115 Wayside Avenue	Masonry Construction	1	Not Specified
17 Town Way	Masonry Construction	1	Not Specified

		Asse	ASSESSOR'S OFFICE INFORMATION	ORMATION
			ABUTTING PROPERTIES	TTIES
Owner Nàme/ Address	MAP AND PARCEL NUMBER	LOCATION OF PROPERTY RELATIVE TO SITE	USE	COMMENTS (WATER SUPPLIES, SEPTIC, ETC., LOCATION RELATIVE TO SITE)
William Parentau 103 Wayside Avenue	81-514	Southwest	Commercial	All developed properties in the vicinity of the site are presumed to be connected to all public utilities.
Nelie A. Kulik 121-123 Wayside Avenue	3200 0081	South	Commercial	
E & L Realty Corporation 131 Wayside Avenue	81-514 3200 0081	South	Commercial	
Robert J. Healy 149 Wayside Avenue	3300 0081	South	Commercial	
Robert J. Healy 161 Wayside Avenue	3400 0081	South	Commercial	
Robert Clark, Jr. 181 Wayside Avenue	3350 0080A	South	Commercial	
Hurley & Johnson 34 Doty Circle	8700 0081	West	Commercial	
Leon W. Jaeger, Jr. 46 Doty Cirole	81 - 221 8750 0081	West	Commercial	
Town of West Springfield Flood Control Dike Town Way		North	Flood Control	

Local Records Review and Interviews

With Local Officials

Project Number 12142A.21E September 29, 1994 Page 9

## **BUILDING INSPECTORS / ENGINEERING OFFICE**

Contact:

Date:

Time:

Personnel

September 29, 1994 10:20 am

	BUILDING INSPECTOR'S OFFICE / ENGINEERING OFFICE  BUILDINGS / STRUCTURES PRESENT ON SITE				
BUILDINGS / STRUCTURES	LOCATION ON SITE	Age	CONSTRUCTION COMMENT	s	
Offices *	115 Wayside Avenue	Not Specified	Concrete Block		
Garage	West End of Town Way	Not Specified	Concrete Block		

Notes: Building Department has following permits on file for Commercial Disposal: November 29, 1988, Rebound Storage Building damaged by fire, 250 feet off road, heated by gas; October 9, 1984, New storage at 17 Town Way, no heat.

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Local Records Review and Interviews

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Water:

Yes

Sewer:

Yes

Stormwater:

Yes

Electric:

Yes

Gas:

Yes

UTILITY CONNECTIONS / AVAILABILITY (IN STREET):

Water:

Yes

Sewer:

Yes

Stormwater:

Yes

Electric:

Yes

Gas:

Yes

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Local Records Review and Interviews

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# ZONING COMMISSION / PLANNING BOARD:

Contact:

Date:

Time:

Nancy Manchino

September 27, 1994 12:30 pm

SITE ZONING:

Designation:

Business B: Across street is industrial park.

Effective Date:

1989

ADJACENT PROPERTIES:

Designation:

Industrial Park (IP)

Effective Date:

1989

PREVIOUS DESIGNATIONS (WITH DATES AND LOCATIONS RELATIVE TO SITE):

Unknown.

ANTICIPATED CHANGES:

On-Site:

None

Neighboring Properties:

None

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# CONSERVATION COMMISSION:

The Conservation Commission was not contacted as part of the present assessment

Local Records Review and Interviews

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## HEALTH DEPARTMENT:

Contact:

Date:

Time:

Mary Liquori

September 27, 1994 12:15 pm

WATER SUPPLIES:

On-Site:

West Springfield Municipal System

Testing:

No testing information was reviewed.

Off-Site:

West Springfield Municipal System

NATURE AND LOCATION OF MUNICIPAL WATER SUPPLY:

Southwick Wells and Bearhole Reservoir

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## TOWN CLERK'S OFFICE

Contact:

Date:

Time:

Pat Whitehead

September 27, 1994

1245 pm

PERMIT LISTING S		n Clerk's Office nce On-Site and Neighboring Pr	OPERTIES	
DATE OF REVIEW:	27, 1994			
LOCATION	DATE	PERMIT TYPE	COMMENTS	
United Parcel Service Wayside Avenue	11/23/65 11/23/65 8/28/91 8/28/91	700 Gallons AST 15,000 Gas & Diesel UST 12,000 Gallons Gasoline UST 11,000 Gallons Diesel UST		
154 Tri-County Contractors 35 Doty Circle	6/28/60 8/19/70	4,000 Gallons Gasoline AST	1.000	
Brinks, Inc.	4	4,000 Gallons UST		

Notes: AST - Above Ground Storage Tank

UST - Underground Storage Tank

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FIRE DEPARTMENT:

Contact:

Date:

Time:

Deputy Chief Ralph Danforth September 29, 1994

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	PROPERTIES
	AND NEIGHBORING
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REVIEW	ON-SITE AN
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FIR	TANKS SE
	D STORAGE
	INDERGROUND
	_

Location	SIZE	CONSTRUCTION	CONTENTS	AGE (YEARS)	INSTALLED!	REMOVED	COMMENTS (CATHODIC PROTECTION, REPAIRS AND DATES, RELINING (DATE), NOTICE OF LEAKS (DATES), TRANSFER LINES AND PIPING)
17 Town Way	3,000 1,000 10,000 1,000 1,000	S S S S S S S S S S S S S S S S S S S	NS NS NS Oil Hydraulic Oil	Z Z Z Z Z W W W	12/17/73 12/17/73 12/17/73 8/29/89 8/29/89	10/10/86 11/18/88 8/28/89 N/A N/A N/A	No record of release No record of release No record of release NS NS
35 Doty Circle 154 Wayside Avenue	4,000	NS NS	Gasoline No. 2 Fuel Oil	34 34	8/19/70	4/22/88 N/A	Tank failed tightness test but no evidence of release noted upon removal of tank.
120 Wayside Avenue	15,700 4,000 1,000 (2) 550 15,000 (2) 10,000	S S S S S S S	NS Diesel No. 2 Fuel Oil Waste Oil NS	29 N/A N/A N/A	11/23/65 NS NS NS NS 11/29/91	N/A 9/23/91 9/23/91 9/23/91 N/A N/A	Water readings indicated possible problems. These tanks for diesel and gasoline.

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## FEDERAL ENVIRONMENTAL RECORDS

CERCLIS L - 8 LISTINGS
(USEPA COMPREHENSIVE ENVIRONMENTAL RESPONSE, SEARCH DISTANCE:

NO CERCLIS sites are located within 1 mile of the site.

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#### U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA)

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) LIST OF HAZARDOUS MATERIALS HANDLERS/GENERATORS
TSD = 1.0 MILES
GENERATORS - ON-SITE AND NEIGHBORING PROPERTIES:

The site is listed as a TSD facility but is awaiting a change of status. The site is also listed as a small quantity generator of hazardous waste.

Numeric Machine Co., Inc., which is located to the south of the site (abutter), is also a small quantity generator of hazardous waste.

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#### MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

#### EMERGENCY RESPONSE (ER) FILE REVIEW

# SEARCH DISTANCE On-SITE AND NEIGHBORING PROPERTIES

FILE LOCATIONS (TOWNS): WEST SPRINGFIELD

FILE DATES: AS SPECIFIED

DATE	EVENT DESCRIPTION	LOCATION (RELATIVE TO SITE)
93	No Emergency Response on record.	
5/20/93	74 Wayside Avenue (Mikes Wholesale Bait) Former Samford Tool - Possible Unsafe Use of formaldehydes reported investigated (unfounded) W93-264. OSHA asked to investigate.	200 feet west.
8/28/91	Report of truck discharging milky white substance to storm drain (or Wayside and Doty Circle). Investigated, case closed.	200 feet west.
10/30/90	Booms in river from United Parcel Service. Spill not working right, storm system will be flushed by O.R. Cote to cleanout.	United Parcel Service is south across Wayside Avenue.
7/8/93	United Parcel Service changing floor drains to town sewer. No problem.	Site No.
12/4/72	17 Town Way - Bill of Lading No. 818 Issued to dispose of four drums of Kwick Wick at Vicon Recovery. O.R. diesel spill.	Site No. On-site
12/01/92	17 Town Way - Thirty gallons diesel to pavement, nozzle fell out of tank.	On-site
8/26/92	GES while working on another job United Parcel Service floor drains and notify DEP.	
88 - 89	Nothing.	
12/5/87	130 Doty Circle - Fifty gallons hydraulic fluid from rubbish truck.	200 feet west.
10/21/80	Wayside fuel from delivery truck spilled three gallons. Speedi-dry.	On-site
4/20/86	17 Town Way - Five gallon overfill speedi-dry.	On-site

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#### MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

#### LEAKING UNDERGROUND STORAGE TANKS FILE REVIEW

#### SEARCH DISTANCE 0.5 MILES

FILE LOCATIONS (TOWNS): WEST SPRINGFIELD

FILE DATES: AS SPECIFIED

DATE	EVENT DESCRIPTION	LOCATION (RELATIVE TO SITE)
1/27/88	Waste oil overflowed UST. Cyn cleaned.	124 Ashley Avenue 0.3 miles south.
6/6/89	Oil out of storm drain into river from United Parcel Service diesel small overfill	United Parcel Service is across Wayside Avenue to the south.
4/30/86	Commercial Disposal - 10,000 gallon No. 2 diesel test failed tight test	149 Wayside Avenue abutter to the south.
5/15/86	Air released from buried manhole and retested without air interface. Passed (DEP notified by Nancy Frantoni, Compliance Manager, letter sent to West Springfield Fire Department on April 30, 1986.	On-site.

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### DEPARTMENT OF ENVIRONMENTAL PROTECTION

STATE LANDFILL OR SOLID WASTE DISPOSAL SITES:

No landfills or solid waste disposal sites were noted within 0.5 miles of the site.

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#### DEPARTMENT OF ENVIRONMENTAL PROTECTION

#### SITES FILE REVIEW

LOCATIONS OF FILES (TOWNS): WEST SPRINGFIELD

SITE NUMBER	Address	LOCATION (RELATIVE TO SITE)	CITATION
10849	Agrimark 958 Riverdale Street	0.9 miles southwest of the site.	Waiver Site
10766	Ricks Mobil 1130 Riverdale Street	0.5 miles southwest of the site.	Waiver Site
10929	Exxon Station 1247 Riverdale Street	0.3 miles southwest of the site.	Waiver Site
10898	Red's Exxon 1528 Riverdale Street	0.3 miles northwest of the site.	Waiver Site
10710	Samford Tool 79 Wayside Avenue	200 feet west of the site.	Waiver Site - Review of information in the file and reports indicates that groundwater flow is north and northeast. Groundwater contamination with 1,1,1-trichloroethane and trichloroethylene is present in samples obtained downgradient on the site.
10300	Texaco 928 Riverdale Street	1 mile southwet of the site.	Confirmed
1-0000464	35 Wayside Avenue	200 feet west of the site.	LTBI

#### WATER SUPPLY OVERLAYS

QUADRANGLES CHECKED:

West Springfield

SITE QUADRANGLE:

West Springfield

AQUIFER TYPE:

On-site:

M<sub>a</sub> - Capable of yielding 1 to 1,000 gallons per minute to individual wells.

Adjacent to site:

M<sub>9</sub>

WATER SUPPLIES:

No public water supplies were noted within 1 mile of the site.

CONTAMINATION SOURCES:

A salt storage facility was noted within 0.5 miles southwest of the site.

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#### SITE VISIT: A

PERFORMED BY:

Glenn Riddle

ACCOMPANIED BY:

Mr. Don LaFerriere, Operations Manager

DATE PERFORMED:

August 2, 1994 and September 29, 1994

#### CURRENT USE OF SITE:

Offices and garage for Commercial Disposal. Some space is also utilized by Oil Recovery Corporation.

#### FORMER USE(S) OF SITE:

The former use of the site was not disclosed during the site visits.

#### DEVELOPMENT:

#### Buildings:

Two buildings are located on-site. One building is located close to Wayside Avenue and supports an office building. The second building is a garage building used for maintenance of Commercial Disposal and Oil Recovery vehicles. This building is approximately 200 feet from Wayside Avenue.

#### Evidence of Former Buildings/Structures:

No evidence of former buildings was noted during the site visits.

#### CURRENT HEATING METHOD:

The office building is heated a natural gas system. The garage building is also heated by a natural gas system which is supplemented by a waste oil burning heating system located in Bay 4.

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#### Evidence of Former Heating Method(s):

No evidence of former heating methods was noted during the site visit.

#### WASTE DISPOSAL:

#### Evidence of Former Waste Disposal Method(s):

#### ROADWAYS:

Access to the site is gained from either Wayside Avenue to the south of the site or Town Way located to the east of the site.

PARKING AREAS (PAVEMENT, ASPHALT/CONCRETE, CONDITION, AREA AND LOCATIONS COVERED):

Parking for cars along east side of the office building. Parking for trucks in the paved area to the east of the garage building.

#### CATCHBASINS (STORMWATER):

One stormwater catch basin is located between the office building and Bay 6 of the garage building.

#### UTILITIES ON SITE:

The site is serviced by natural gas, electricity, telephone, municipal water and municipal sewer connections.

#### Utilities Formerly on Site:

No evidence of former utilities was noted on the site.

#### WELLS (DRINKING/INDUSTRIAL/IRRIGATION) PRESENT ON SITE:

Four of five groundwater monitoring wells installed by HRP Associates were located on the site.

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#### FENCING (ACCESS:LIMITATIONS):

Fencing is located along the site boundary to the east and north between the site and West Springfield Flood Control property.

#### EVIDENCE OF FILLING/EXCAVATION:

An area of the site has been excavated, filled and paved as part of a RCRA closure of the site, however, no evidence of the excavation was noted during the site visit.

#### OIL AND HAZARDOUS MATERIALS CURRENTLY USED / STORED ON-SITE:

Waste oil containers and a waste oil burner were observed in Bay 4 of the garage building. This waste oil and burner supplements the gas fired heating system. Two above ground storage tanks were also observed in Bay 4. Diesel (500 gallon tank) and lubricating oil (275 gallon tank) owned by Oil Recovery were located in this area. Various automotive repair fluids are utilized in the garage building. One 500-gallon kerosene above ground storage tank in Bay 1 is used to fuel a steam cleaner which is used to clean vehicles. Three underground storage tank (UST) are located on the site. One 10,000-gallon UST (diesel) and two 1,000-gallon USTs (hydraulic oil and engine oil) are located on the site.

#### FACILITIES PRESENT (ON-SITE):

Floor Drains:

Floor drains in the maintenance building collect wastewater from

vehicle maintenance. This waste discharges to

Dry wells/Pits:

None observed.

Machine Pits:

None observed.

Service Pits:

None observed.

Hydraulic Lifts;

None observed.

Pump Islands:

Loading Racks:

One dispensing pump associated with the 10,000-gallon UST was observed.

None observed.

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Document: Section.1 Site Location and Setting

Site Visit

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Lagoons:

None observed.

Transformers:

None observed.

#### FACILITIES PRESENT (ADJACENT TO SITE):

Pump Islands:

UPS which is located south of the site across Wayside Avenue is

equipped with a pump island.

Loading Racks:

None observed.

Lagoons:

None observed.

Transformers:

Pole mounted transformers were observed along Wayside Avenue.

#### VEGETATION (INDICATIONS OF STRESS, ABSENCE OF VEGETATION):

The site is almost entirely paved or covered by buildings. Very little vegetation was observed on-site. Vegetation present around the office building did not appear to be stressed. Vegetation on surrounding property also did not appear to be stressed.

#### WETLANDS:

No evidence of wetlands was noted during the site visit.

#### SURFACE SOIL (INDICATIONS OF STAINING, RELEASES):

Incidental oil staining was noted in the paved areas of the site. No surface soil staining was noted during the site visit.

#### ABUTTING PROPERTIES:

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Document: Section.1 Site Location and Setting

Site Visit

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Use:

Abutting properties to the south include a residential house, commercial and industrial businesses and Wayside Avenue. Town Way abuts the site to the east.

Use/Storage/Disposal of Oil/Hazardous Materials:

Commercial and industrial businesses on Doty Circle abut the site to the west.

#### DRILLING EQUIPMENT STANDARDS

#### 1. Equipment Decontamination

All drilling equipment and associated tools, including but not limited to, augers, drill rods, sampling equipment, wrenches, etc., that may have come in contact with any material which could cause contamination shall be decontaminated using a high pressure detergent steam cleaning equipment, followed by, if needed a nanograde methanol swabbing. This will be followed by a distilled or controlled water rinse. The control water shall be obtained from a source approved by the supervising field representative.

#### 2. Equipment and Materials

All equipment will be in good repair and in proper working order with no visible signs of oil or hydraulic fluid leaks.

The drill rig shall be capable of providing a power driven sectional hollow stem auger flights with a minimum inside diameter of 2 1/2 inches to a minimum depth of 60 feet. In addition, the following equipment shall be available:

- A. Drill Rods, minimum size equivalent to the "A" Rod, (1 5/8 inches 0.D. and 1 1/8 1.D.),
  - B. 140 lb. Drive Hammer and 300 lb. Drive Hammer,
  - C. 2 Inch O.D. Spilt Spoon Sampler,
  - D. Hollow Stem Auger Plug,
  - E. Roller Bit and Diamond Corer Bit,
  - F. Water Tank and Pump,
  - G. Any other equipment needed to successfully complete job.

#### MONITORING WELL CONSTRUCTION

#### I. Materials

All materials used in the completion of monitoring wells shall be in good condition and free of any signs of possible contamination. The following materials may be used in the completion of monitoring wells:

- 1) 2" Flush Joint Threaded PVC Well Screen and Riser Casing (Schedule 40 or 80)
- 2) Washed Ottawa Sand
- 3) Bentonite Grout
- 4) Portland Cement
- 5) Filter Fabric
- 6) Vented Steel Locking Well Casing and Lock or Curb Box

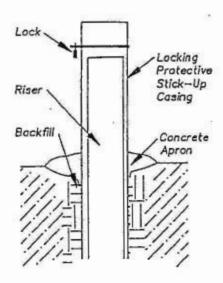
#### II. Installation

After the selected depth has been reached by augering, placement of a specified length of PVC screen and riser will be installed into the augers. If warranted, filter fabric should be placed on screen prior to insertion into auger to facilitate filtration. Ottawa sand will be used to pack the screen to prevent plugging. Retrack augers to top of screen and measure with weighted tape to ensure the screen has been fully covered. Add enough bentonite until the screen has been sealed off from horizontal and/or vertical flow above the screened interval. Again, measure to assure bentonite is not "hung up" in casing.

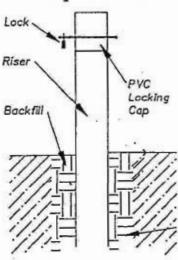
The auger string is again pulled back and natural soils are allowed to collapse. Measurements should be made to assure this collapse. If natural materials are not collapsing, clean ottawa sand will be used to fill the voids. Install an additional bentonite seal two (2) to three (3) feet below ground level.

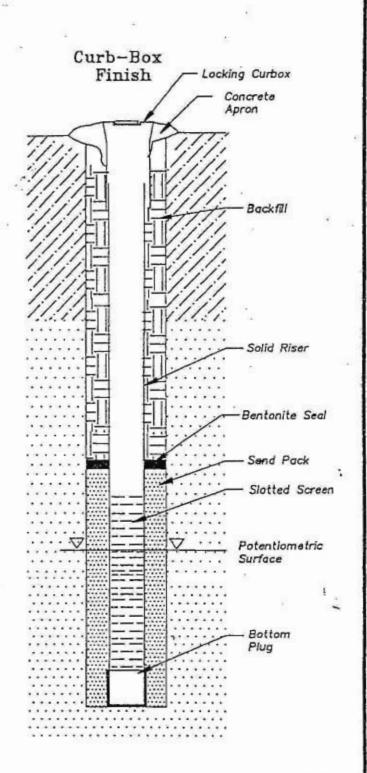
Once the auger string has been removed the protective steel casing will be installed. Said steel pipe will be secured by a portland cement seal. The cement seal shall be a minimum of two (2) foot in diameter and shall be gently sloped to drain water away from well.

# Locking Protective Pipe Finish



Locking PVC Cap Finish





GROUNDWATER MONITORING WELL With Alternative Finishings

#### Volatile Organic Compound Screening Procedures

- Soil -

Samples of soil collected from a site are screened in the field or in-house for the presence of volatile organic compounds (VOCs). Soil screening procedures employ headspace techniques to remove a sample in the vapor state for VOC screening. Headspace in the sample container is screened for VOC using the screening procedures outlined below. Screening results are not equivalent to quantitative laboratory results and are not represented as such.

#### Instrument:

The instrument used by Environmental Compliance Services, Inc. (ECS) for VOC screening of soils is the H-Nu Model Pl-101 Organic Vapor Detector which is equipped with a 10.2 eV probe. The H-Nu is calibrated to a benzene gas standard and detects the total gross VOC's in the headspace. The detection limit of the H-Nu is 0.2 ppm for benzene.

#### Procedure:

The soil screening procedure used is based upon the "Jar Headspace Analytical Screening Procedure" outlined in the Massachusetts Management Procedures for Excavated Soils Contaminated with Virgin Petroleum Oils Policy #WSC-89-001.

- Half-fill two (2) clean glass jars with the sample to be analyzed. Quickly cover each open top
  with one or two sheets of clean aluminum foil and subsequently apply screw caps to tightly seal
  the jars. Sixteen ounce (16 oz.) (approx. 500 ml) soil or "mason" type jars are preferred. Jars
  less than 8 oz. (approximately 250 ml) total capacity will not be used.
- Allow headspace development for at least 10 minutes. <u>Vigorously shake jars for 15 seconds</u>
   <u>both at the beginning and end of the headspace development period</u>. Where ambient
   temperatures are below 32° F (0° C), headspace development should be performed within a
   heated vehicle or building.
- Subsequent to headspace development, remove the screw lid to expose the foil seal. Quickly
  puncture foil seal with the instrument sampling probe, to a point about one-half of the headspace
  depth. Exercise care to avoid uptake of water droplets or soil particulates.

Rev. Date: 4/94

File: Appendix.PRO

- 4. Following probe insertion through the foil seal and/or sample injection to probe, note and record the higher meter response as the jar headspace concentration. When using the foil seal/probe insertion method, the maximum response should occur between 2 and 5 seconds. Erratic meter response may occur at high organic vapor concentrations or conditions of elevated headspace moisture, in which case headspace data should be discounted. It is reasonable to suspect elevated moisture in the headspace when the H-Nu meter returns to zero in a much slower response when the probe is removed from the headspace.
- 5. The headspace screening data from both jar samples should be recorded and compared; generally, replicate values should be consistent to plus or minus 20%.
- 6. PID field instruments shall be operated and calibrated to yield "total organic vapors" in ppm (v/V) as benzene. Operation, maintenance, and calibration shall be performed in accordance with the manufacturer's specifications. For jar headspace analysis, instrument calibration shall be checked/adjusted no less than once every 10 analyses, or daily, whichever is greater.

#### ECS WATER SAMPLING PROCEDURES

#### Groundwater Sampling Procedures

Groundwater samples are collected from monitoring wells in accordance with DEP protocol as described in "Standard References for Monitoring Wells", Massachusetts Department of Environmental Protection Publication No. WSC-310-91. Prior to leaving the ECS facility, ECS personnel inspect all equipment and materials to be used during a sampling event to assure that it is in good working order and that it is clean to avoid possible sample contamination. Once in the field, the following procedures are employed in sequence during each sampling event:

- The well is identified and the individual well designation is recorded on an ECS Monitoring Well Sampling Log.
- The protective casing is opened, and when appropriate, measurements of the concentration of organic gases in the well casing are made using a portable photoionization detector and recorded.
- 3. Groundwater level and total depth of the well measurements are made from a designated reference point located at the top of the well casing. An electronic water level indicator or acoustic sounding device accurate to 0.01 feet is used for all measurements. All measurements are recorded on the ECS Monitoring Well Sampling Log. The volume of standing water within the well is calculated and recorded.
- 4. To insure the collection of a representative groundwater sample, the standing water within the well is purged (evacuated). The procedure used for well purging depends on the hydraulic yield of the well. When purging low yield wells, the well is evacuated to dryness once prior to sampling. In high yield wells, a quantity of water equal to three (3) to five (5) times the standing water purged in recorded on the ECS Monitoring Well Sampling Log. Groundwater is purged from the well using a non-contaminating water pump, a PVC bailer, or a stainless steel bailer. When using a pump, only clean polyethylene tubing is used in each well. In appropriate situations, the polyethylene tubing is stored in the well casing for use during future sampling events. When using a bailer, only virgin polypropylene rope is used to suspend it. Purge volumes are measured by pumping or bailing groundwater directly into a container of known volume. Care is taken to record on the Monitoring Well Sampling Log any "floating" product, petroleum sheen, odors, or other evidence of possible groundwater contamination observed in the purge water. When product is present, the purge water will be collected for proper disposal. Otherwise, the purge water is recharged to the same aguifer within 20 feet of the well.

5. If a bailer was not used to purge the well, a clean PVC or stainless steel bailer, equipped with a teflon check valve and suspended by virgin polypropylene rope, is lowered into the well and rinsed three (3) times with the groundwater to be sampled. A sample is then retrieved for field measurements of the temperature, pH and specific conductance of the groundwater. Samples for laboratory analysis are collected with the bailer and transferred to appropriate sample containers. A separate, pre-cleaned bailer is employed for each monitoring well.

When sampling for volatile organic compounds (VOC), care is taken to avoid any unnecessary sample aeration. VOC samples are collected in EPA approved 40 ml. vials sealed with teflon lines septum caps. Care is taken to assure that no air bubbles are sealed within the vial.

When sampling for dissolved metals analyses, groundwater samples are filtered immediately, or as soon as possible, through clean 0.45 um membranes, transferred to clean polyethylene containers, and preserved with 1:1 reagent grade nitric acid to a pH less than 2. Only laboratory grade glass or polysulfone filter holders and receivers are used.

- All sample containers are properly labeled, logged in on an ECS Chain of Custody Form, and immediately placed on ice for transport to the laboratory.
- All sampling equipment (except for dedicated tubing when appropriate) is retrieved and the protective casing is secured.

Sample Container, Preservation, and Holding Time

Sample container, preservation, and holding time requirements for common sampling parameters is presented in Table 1.

# Equipment Decontamination

To avoid sample cross-contamination, the following procedures are employed to properly decontaminate sampling equipment:

#### Bailers

Immediately after sampling the bailer is rinsed with clean potable tap water to remove the majority of the contaminants encountered and placed in a plastic bag for transport to the ECS facility. Once at ECS, each bailer is disassembled, soaked and thoroughly scrubbed with "Alconox" brand laboratory detergent, and rinsed finally with clean potable tap water. Each bailer is then allowed to air dry in a vertical position. When the bailer is to be used to collect a sample for dissolved metals analysis, the bailer is rinsed with reagent grade deionized water instead of tap water.

#### Field Filtering Equipment

All filtering equipment is decontaminated by washing with 10 percent reagent grade nitric acid followed by rinsing with deionized water between each sample.

#### Water Level Indicators

Water level indicators are decontaminated between wells by rinsing with clean water, washing with reagent grade methanol, and rinsing finally with clean water.

#### Surface Water Sampling Procedures

Surface water samples are collected in accordance with the protocols outlined below.

- The desired sampling location is approached from downstream to avoid upstream disturbances which could result in the collection of unrepresentative samples.
- Field measurements of the temperature, pH, and specific conductance of the water are made by directly submersing the appropriate instruments into the water stream. The results are recorded.
- Completely submerse the appropriate sample containers to a depth of approximately 2/3 of the total depth of water measured up from the bottom of the stream, being careful to remain Downstream of the sample container with the opening facing upstream. After the containers have filled with water, remove, cap, and properly label each container.

Samples for VOC analysis are collected in EPA approved 40 ml. vials sealed with teflon lined septum caps. Care is taken to avoid any unnecessary sample aeration which could result in loss of volatile constituents, and to assure that on air bubbles are sealed within the vial.

# TABLE 1 LIST OF SAMPLE CONTAINER, PRESERVATION, AND HOLDING TIME REQUIREMENTS

PARAMETER	MEDIA	CONTAINER	PRESERVATIVE	HOLDING TIME
Volatile Organics	Water	3 40 ml glass vials with taflon lined septum caps	2 drops 1:1 HCl, cool 4°C	14 days
	Soil	2 40 ml glass vials with tefion lined septum caps	cool 4°C	14 days
Semi-Voletile	Water	1 L amber glass bottle	cool 4°C	14 days
Organics	Soil	8-oz. glass jars	cool 4°C	14 days
Total Petroleum	Water	1 L amber glass bottle	cool 4°C, HCl to pH < 2	14 days
Hydrocarbons	Soil	8-oz, glass jers	cool 4°C	14 days
Metals	Water	1 Ł plastic bottles	Dissolved- field filtration (0.45 micron), HNO <sub>3</sub> pH < 2	6 months
			Totel- HNO <sub>3</sub> pH < 2, cool 4°C	
	Soil	8-oz. glass jars	cool 4°C	6 months
PCB's	Water	1 L amber glass bottle	cool 4°C	7 days (until extraction) 40 days (after extraction)
12	Soil	8-oz. glass jars	cool 4°C	7 days (until extraction) 40 days (after extraction)
Pesticides	Water	1 L amber glass bottle	cool 4°C	7 days (until extraction) 40 days (after extraction)
	Soil	8-oz. glass jars	cool 4*C	7 days (until extraction) 40 days (after extraction)

#### Note: Sources:

- 1) "Standard References for Monitoring Wells", Massachusetts Department of Environmental Protection Publication # WSC-310-91, January, 1991.
- 2) Methods of chemical analysis of water and wastes, U.S. EPA 600/4-79-020, EMSL 1983.
- 3) Test methods for Evaluating Solid Waste, Physical/Chemical Methods, U.S. EPA SW-846, 1986.

Rev. Date: 4/94

File: Appendix.PRO

Samples for total metals analyses are preserved immediately with 1:1 reagent grade nitric acid.

 Log in each sample on the ECS Chain of Custody Form and place on ice for transport to the laboratory.

Rev. Date: 4/94

File: Appendix,PRO



Massachusetts Certification M-MA 138 Connecticut Approval # PH 0777 Rhode Island # 98 & Maine # n/a New Hampshire ID#253893 New York ID#11393

ECS, Inc. 588 Silver Street Agawam, MA 01001

August 22, 1994

Attn: G. Riddle

Client Project No.: 12142

Location: Commercial Disposal - W.S.

Lab ID No.	Client ID	Analysis Requested
AA19729	MW-2	EPA 8240/624
AA19730	MW-3	TPH by GC (water)  EPA 8240/624
AA19731	MW-4	TPH by GC (water)  EPA 8240/624
AA19732	MW-5	TPH by GC (water)  EPA 8240/624
AA19733	TRIPBLNK	TPH by GC (water)  EPA 8240/624
AA19734	FIELDBNK	EPA 8240/624

Authorized by

Hanibal Tayoh

General Manager

Laboratory Report

Client ID: MW-2 Lab ID No: AA19729 Location: Commercial Disposal - W.S.

Client Job No.: 12142

Matrix: Water Sampled on 08/09/94 by R. HAYNES/ECS Received on 08/09/94 by ATO QC and Data Review by HT

Preservative: Refrigeration, HCl Container : 2 VOA Vials Condition of Sample as Received: Satisfactory Delivered by: Client

Vol	atil	e O	rga	mics
EPA	Meth	ods	624/	8240

	EPA Methods 624/	8240	9	
Parameter	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	3.3	1	08/17/94	GM
Bromodichloromethane	Not detected	1	08/17/94	GM
Bromomethane	Not detected	1	08/17/94	GM
Bromoform	Not detected	1	08/17/94	GM
Carbon tetrachloride	Not detected	1	08/17/94	GM
Chlorobenzene	Not detected	1	08/17/94	GM
Chloroethane	Not detected	5	08/17/94	GM
Chloroform	Not detected	· 1	08/17/94	GM
Chloromethane	Not detected	5	08/17/94	GM
Dibromochloromethane	Not detected	1	08/17/94	GM
1,2-Dichlorobenzene	Not detected	1	08/17/94	GM
1,3-Dichlorobenzene	Not detected	1	08/17/94	GM
1,4-Dichlorobenzene	Not detected	1	08/17/94	GM
1,1-Dichloroethane	Not detected	1	08/17/94	GM
1,2-Dichloroethane	Not detected	1	.08/17/94	GM
1,1-Dichloroethene	Not detected	1	08/17/94	GM
trans-1,2-Dichloroethene	Not detected	1	08/17/94	GM
1,2-Dichloropropane	Not detected	1	08/17/94	GM
cis-1,3-Dichloropropene	Not detected	1	08/17/94	GM
trans-1,3-Dichloropropene	Not detected	1	08/17/94	GM
Ethylbenzene	Not detected	1	08/17/94	GM
Methylene chloride	Not detected	2.5	08/17/94	GM
1,1,2,2-Tetrachloroethane	Not detected	1	08/17/94	GM
Tetrachloroethene	5.4	1	08/17/94	GM
Toluene	Not detected	1	08/17/94	GM
1,1,1-Trichloroethane	1.3	1	08/17/94	GM
1,1,2-Trichloroethane	Not detected	1	08/17/94	GM
Trichloroethene	Not detected	1	08/17/94	GM
Trichlorofluoromethane	Not detected	1	08/17/94	GM
m,p-Xylenes	Not detected	2	08/17/94	GM
o-Xylene	6.7	1	08/17/94	GM
Vinyl chloride	Not detected	1	08/17/94	GM
Methyl-t-butyl ether	Not detected	1	08/17/94	GM
BFB Surrogate Recovery (%)	97	81	08/17/94	GM
p-DFB Surrogate Recovery (%)	100	(	08/17/94	GM
CLB-d5 Surrogate Recovery (%)	98		08/17/94	GM

Laboratory Report

Client ID: MW-3 Lab ID No: AA19730 Location: Commercial Disposal - W.S.

Client Job No.: 12142

Matrix: Water Sampled on08/09/94 by R. HAYNES/ECS Received on 08/09/94 by ATO QC and Data Review by HT

Preservative: Refrigeration, HCl Container: 2 VOA Vials Condition of Sample as Received: Satisfactory Delivered by: Client

Vo	latile Orga	nics
EPA	Methods 624	8240

	EPA Methods 624/	8240		
Parameter	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1	08/17/94	GM
Bromodichloromethane	Not detected	1	08/17/94	GM
Bromomethane	Not detected	- 1	08/17/94	GM
Bromoform	Not detected	1	08/17/94	GM
Carbon tetrachloride	Not detected	1	08/17/94	GM
Chlorobenzene	Not detected	1	08/17/94	GM
Chloroethane	Not detected	5	08/17/94	GM
Chloroform	Not detected	- 1	08/17/94	GM
Chloromethane	Not detected	5	08/17/94	GM
Dibromochloromethane	Not detected	1	08/17/94	GM
1,2-Dichlorobenzene	Not detected	1	08/17/94	GM
1,3-Dichlorobenzene	Not detected	1	08/17/94	GM
1,4-Dichlorobenzene	Not detected	1	08/17/94	GM
1,1-Dichloroethane	Not detected	1	08/17/94	GM
1,2-Dichloroethane	Not detected	1	08/17/94	GM
1,1-Dichloroethene	Not detected	1	08/17/94	GM
trans-1,2-Dichloroethene	Not detected	1	08/17/94	GM
1,2-Dichloropropane	Not detected	1	08/17/94	GM
cis-1,3-Dichloropropene	Not detected	1	08/17/94	GM
trans-1,3-Dichloropropene	Not detected	1	08/17/94	GM
Ethylbenzene	Not detected	1	08/17/94	GM
Methylene chloride	Not detected	2.5	08/17/94	GM
1,1,2,2-Tetrachloroethane	Not detected	1	08/17/94	GM
Tetrachloroethene	2.8	1	08/17/94	GM
Toluene	Not detected	1	08/17/94	GM
1,1,1-Trichloroethane	3.4	1	08/17/94	GM
1,1,2-Trichloroethane	Not detected	1	08/17/94	GM
Trichloroethene	Not detected	1	08/17/94	GM
Trichlorofluoromethane	Not detected	1	08/17/94	GM
m,p-Xylenes	Not detected	2	08/17/94	GM
o-Xylene	Not detected	1	08/17/94	GM
Vinyl chloride	Not detected	1	08/17/94	GM
Methyl-t-butyl ether	3.2	1	08/17/94	GM
BFB Surrogate Recovery (%)	105		08/17/94	GM
p-DFB Surrogate Recovery (%)	103	*	08/17/94	GM
CLB-d5 Surrogate Recovery (%)	102		08/17/94	GM

Laboratory Report

Client ID: MW-4 Lab ID No: AA19731 Location: Commercial Disposal - W.S.

Client Job No.: 12142

Matrix: Water Sampled on 08/09/94 by R. HAYNES/ECS Received on 08/09/94 by ATO QC and Data Review by HT

Preservative: Refrigeration, HCl Container: 2 VOA Vials Condition of Sample as Received: Satisfactory Delivered by: Client

Vo	atile	Orga	nics
EPA	Method	ds 624/	8240

Parameter	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1	08/18/94	GM
Bromodichloromethane	Not detected	1	08/18/94	GM
Bromomethane	Not detected	- 1	08/18/94	GM
Bromoform	Not detected	1	08/18/94	GM
Carbon tetrachloride	Not detected	1	08/18/94	GM
Chlorobenzene	Not detected	1	08/18/94	GM
Chloroethane	Not detected	5	08/18/94	GM
Chloroform	Not detected	- 1	08/18/94	GM
Chloromethane	Not detected	5	08/18/94	GM
Dibromochloromethane	Not detected	1	08/18/94	GM
1,2-Dichlorobenzene	Not detected	1	08/18/94	GM
1,3-Dichlorobenzene	Not detected	1	08/18/94	GM
1,4-Dichlorobenzene	Not detected	1	08/18/94	GM
1,1-Dichloroethane	Not detected	1	08/18/94	GM
1,2-Dichloroethane	Not detected	1	08/18/94	GM
1,1-Dichloroethene	Not detected	1	08/18/94	GM
trans-1,2-Dichloroethene	Not detected	1	08/18/94	GM
1,2-Dichloropropane	Not detected	1	08/18/94	GM
cis-1,3-Dichloropropene	Not detected	1	08/18/94	GM
trans-1,3-Dichloropropene	Not detected	1	08/18/94	GM
Ethylbenzene	Not detected	1	08/18/94	GM
Methylene chloride	Not detected	2.5	08/18/94	GM
1,1,2,2-Tetrachloroethane	Not detected	1	08/18/94	GM
Tetrachloroethene	11	1	08/18/94	GM
Toluene	Not detected	1	08/18/94	GM
1,1,1-Trichloroethane	6.5	1	08/18/94	GM
1,1,2-Trichloroethane	Not detected	1	08/18/94	GM
Trichloroethene	Not detected	1	08/18/94	GM
Trichlorofluoromethane	Not detected	1	08/18/94	GM
m,p-Xylenes	Not detected	2	08/18/94	GM
o-Xylene	Not detected	1	08/18/94	GM
Vinyl chloride	Not detected	1	08/18/94	GM
Methyl-t-butyl ether	Not detected	1	08/18/94	GM
BFB Surrogate Recovery (%)	99		08/18/94	GM
p-DFB Surrogate Recovery (%)	101	1	08/18/94	GM
CLB-d5 Surrogate Recovery (%)	101		08/18/94	GM

Laboratory Report

Client ID: MW-5 Lab ID No: AA19732 Location: Commercial Disposal - W.S.

Client Job No.: 12142

Matrix: Water Sampled on08/09/94 by R. HAYNES/ECS Received on 08/09/94 by ATO QC and Data Review by HT

Preservative: Refrigeration, HCl Container: 2 VOA Vials Condition of Sample as Received: Satisfactory Delivered by: Client

Vo.	lati	le t	Org	anics
Service a			200	/8240

Parameter	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1	08/19/94	GM
Bromodichloromethane	Not detected	1	08/19/94	GM
Bromomethane	Not detected	. 1	08/19/94	GM
Bromoform	Not detected	1	08/19/94	GM
Carbon tetrachloride	Not detected	1	08/19/94	GM
Chlorobenzene	Not detected	1	08/19/94	GM
Chloroethane	Not detected	5	08/19/94	GM
Chloroform	Not detected	· 1	08/19/94	GM
Chloromethane	Not detected	5	08/19/94	GM
Dibromochloromethane	Not detected	1	08/19/94	GM
1,2-Dichlorobenzene	Not detected	1	08/19/94	GM
1,3-Dichlorobenzene	Not detected	1	08/19/94	GM
1,4-Dichlorobenzene	Not detected	1	08/19/94	GM
1,1-Dichloroethane	1.4	1	08/19/94	GM
1,2-Dichloroethane	Not detected	1	08/19/94	GM
1,1-Dichloroethene	Not detected	1	08/19/94	GM
trans-1,2-Dichloroethene	Not detected	1	08/19/94	GM
1,2-Dichloropropane	Not detected	1	08/19/94	GM
cis-1,3-Dichloropropene	Not detected	1	08/19/94	GM
trans-1,3-Dichloropropene	Not detected	1	08/19/94	GM
Ethylbenzene	Not detected	1	08/19/94	GM
Methylene chloride	Not detected	2.5	08/19/94	GM
1,1,2,2-Tetrachloroethane	Not detected	1	08/19/94	GM
Tetrachloroethene	34	1	08/19/94	GM
Toluene	Not detected	1	08/19/94	GM
1,1,1-Trichloroethane	Not detected	1	08/19/94	GM
1,1,2-Trichloroethane	Not detected	1	08/19/94	GM
Trichloroethene	9.5	1	08/19/94	GM
Trichlorofluoromethane	Not detected	1	08/19/94	GM
m,p-Xylenes	Not detected	2	08/19/94	GM
o-Xylene	Not detected	1	08/19/94	GM
Vinyl chloride	Not detected	1	08/19/94	GM
Methyl-t-butyl ether	Not detected	1	08/19/94	GM
BFB Surrogate Recovery (%)	109		08/19/94	GM
p-DFB Surrogate Recovery (%)	103		08/19/94	GM
CLB-d5 Surrogate Recovery (%)	105		08/19/94	GM

Laboratory Report

Client ID: TRIPBLNK Lab ID No: AA19733

Location: Commercial Disposal - W.S.

Client Job No.: 12142

Matrix: Water Sampled on08/09/94 by R. HAYNES/ECS Received on 08/09/94 by ATO QC and Data Review by HT

Preservative: Refrigeration, HCl Container: 1 VOA Vial Condition of Sample as Received: Satisfactory Delivered by: Client

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-	4 4 -1			8240

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Parameter	Result (in ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1	08/17/94	GM
Bromodichloromethane	Not detected	1	08/17/94	GM
Bromomethane	Not detected	1	08/17/94	GM
Bromoform	Not detected .	1	08/17/94	GM
Carbon tetrachloride	Not detected	1	08/17/94	GM
Chlorobenzene	Not detected	1	08/17/94	GM
Chloroethane	Not detected	5	08/17/94	GM
Chloroform	Not detected	. 1	08/17/94	GM
Chloromethane	Not detected	5	08/17/94	GM
Dibromochloromethane	Not detected	1	08/17/94	GM
1,2-Dichlorobenzene	Not detected	1	08/17/94	GM
1,3-Dichlorobenzene	Not detected	1	08/17/94	GM
1,4-Dichlorobenzene	Not detected	1	08/17/94	GM
1,1-Dichloroethane	Not detected	1	08/17/94	GM
1,2-Dichloroethane	Not detected	1	08/17/94	GM
1,1-Dichloroethene	Not detected	1	08/17/94	GM
trans-1,2-Dichloroethene	Not detected	1	08/17/94	GM
1,2-Dichloropropane	Not detected	1	08/17/94	GM
cis-1,3-Dichloropropene	Not detected	1	08/17/94	GM
trans-1,3-Dichloropropene	Not detected	1	08/17/94	GM
Ethylbenzene	Not detected	1	08/17/94	GM
Methylene chloride	Not detected	2.5	08/17/94	GM
1,1,2,2-Tetrachloroethane	Not detected	1	08/17/94	GM
Tetrachloroethene	Not detected	1	08/17/94	GM.
Toluene	Not detected	1	08/17/94	GM
1,1,1-Trichloroethane	Not detected	1	08/17/94	GM
1,1,2-Trichloroethane	Not detected	1	08/17/94	GM
Trichloroethene	Not detected	1.	08/17/94	GM
Trichlorofluoromethane	Not detected	1	08/17/94	GM
m,p-Xylenes	Not detected	2	08/17/94	GM
o-Xylene	Not detected	1	08/17/94	GM
Vinyl chloride	Not detected	1	08/17/94	GM
Methyl-t-butyl ether	Not detected	1	08/17/94	GM
BFB Surrogate Recovery (%)	104		08/17/94	GM
p-DFB Surrogate Recovery (%)	103	*	08/17/94	GM
CLB-d5 Surrogate Recovery (%)	100		08/17/94	GM

Laboratory Report

Client ID: FIELDBNK

Location: Commercial Disposal - W.S. Client Job No.: 12142

Lab ID No: AA19734

Matrix: Water Sampled on 08/09/94 by R. HAYNES/ECS Received on 08/09/94 by ATO QC and Data Review by HT

Preservative: Refrigeration, HCl Container: 1 VOA Vial Condition of Sample as Received: Satisfactory Delivered by: Client

Vol	ati.	le C	rga	anics
				8240

	Parameter	Result (in ug/L)	MDL	Analyzed	Analyst
a	Benzene	Not detected	1	08/17/94	GM
	Bromodichloromethane	Not detected	1	08/17/94	GM
	Bromomethane	Not detected	î	08/17/94	GM
	Bromoform	Not detected	1	08/17/94	GM
	Carbon tetrachloride	Not detected	1	08/17/94	GM
	Chlorobenzene	Not detected	1	08/17/94	GM.
	Chloroethane	Not detected	5	08/17/94	GM
	Chloroform	Not detected	. 1	08/17/94	GM
	Chloromethane	Not detected	5	08/17/94	GM
	Dibromochloromethane	Not detected	1	08/17/94	GM
	1,2-Dichlorobenzene	Not detected	1	08/17/94	GM
	1,3-Dichlorobenzene	Not detected	7	08/17/94	GM
	1,4-Dichlorobenzene	Not detected	1	08/17/94	GM
	1,1-Dichloroethane	Not detected	î	08/17/94	GM
	1,2-Dichloroethane	Not detected	1	08/17/94	GM
	1,1-Dichloroethene	Not detected	1	08/17/94	GM
	trans-1,2-Dichloroethene	Not detected	1	08/17/94	GM
	1,2-Dichloropropane	Not detected	1	08/17/94	- GM
	cis-1,3-Dichloropropene	Not detected	1	08/17/94	GM
	trans-1,3-Dichloropropene	Not detected	1	08/17/94	GM
	Ethylbenzene	Not detected	1	08/17/94	GM
	Methylene chloride	Not detected	2.5	08/17/94	GM
	1,1,2,2-Tetrachloroethane	Not detected	2.5		GM
	Tetrachloroethene	Not detected	1	08/17/94	GM
	Toluene		1	08/17/94	GM
		Not detected Not detected	1	08/17/94	GM
	1,1,1-Trichloroethane		1	08/17/94	GM
	1,1,2-Trichloroethane Trichloroethene	Not detected Not detected	1	08/17/94	GM
	Trichlorofluoromethane	Not detected Not detected	1	08/17/94 08/17/94	GM
		Not detected	2		GM
	m,p-Xylenes	Not detected	2	08/17/94	GM
	o-Xylene	2 CANADA CARA CARA CARA CARA CARA CARA CARA C	1	08/17/94	
	Vinyl chloride	Not detected	1	08/17/94	GM
	Methyl-t-butyl ether	Not detected	1	08/17/94	GM
	BFB Surrogate Recovery (%)	96		08/17/94	GM
*	p-DFB Surrogate Recovery (%)	100		08/17/94	GM
	CLB-d5 Surrogate Recovery (%)	100		08/17/94	GM
	W. 4500 SS 100 100 100				

Laboratory Report

Client ID: MW-3 Lab ID No: AA19730 Location: Commercial Disposal - W.S.

Client Job No.: 12142

Matrix: Water Collected: 08/09/94 by R. HAYNES/ECS Received on 08/09/94 by ATO QC and Data Review by HT

Preservative: Refrigeration Container: 1 Amber Glass Liter

Condition of Sample as Received: Satisfactory Delivered by: Client

# Total Hydrocarbons by GC Modified EPA Method 8100

Parameter	Result (mg/L)	MDL	Extracted	Analyzed	Analyst
Total Hydrocarbons (GC)	Not detected		08/18/94	08/21/94	TG .
Fingerprint based quantification:		a a	150		81
Gasoline	Not detected	0.4	08/18/94	08/21/94	TG
Fuel Oil #2	Not detected	0.4	08/18/94	08/21/94	TG
Fuel Oil #4	Not detected	0.7	08/18/94	08/21/94	TG
Fuel Oil #6	Not detected	0.7	08/18/94	08/21/94	TG
Motor Oil	Not detected	0.7	08/18/94	08/21/94	TG
Ligroin	Not detected	0.4	08/18/94	08/21/94	TG
Aviation Fuel	Not detected	0.4	08/18/94	08/21/94	TG
Other Oil	Not detected	0.7	08/18/94	08/21/94	TG
Unidentified	Not detected		08/18/94	08/21/94	TG

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from petroleum products. Possible match categories are as follows;

Gasoline - includes regular, unleaded, premium, etc.

Fuel Oil #2 - includes home heating oil, #2 fuel oil and diesel.

Fuel Oil #4 - Includes #4 Fuel Oil.

Fuel Oil #6 - includes #6 oil and bunker "C" oil.

Motor Oil - includes virgin and waste automobile.

Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha.

Aviation Fuels - includes Kerosene, Jet A and JP-4.

Other Oil - includes lubricating and cutting oil and silicon oil.

Factors such as microbial degradation, weathering and solubility generally prevent specific identification within a petroleum category. A finding of "unidentified" means that the sample fingerprint was characteristic of a petroleum product, but could not be matched to a fingerprint in the library.

After fingerprint identification, the amount present in the sample is quantified using a calibration curve prepared from a petroleum product of the same category as the identified petroleum. Unidentified petroleum is quantified using a petroleum calibration that approximates the distribution of compounds in the sample.

A \* in the results column indicates the petroleum calibration used to quantify unidentified samples.

Laboratory Report

Client ID: MW-4 Lab ID No: AA19731 Location: Commercial Disposal - W.S.

Client Job No.: 12142

Matrix: Water

Collected: 08/09/94 by R. HAYNES/ECS Received on 08/09/94 by ATO QC and Data Review by HT

Preservative: Refrigeration Container: 1 Amber Glass Liter Condition of Sample as Received: Satisfactory

Delivered by: Client

# Total Hydrocarbons by GC

Modified EPA Method 8100

Parameter	Result (mg/L)	MDL	Extracted	Analyzed	Analyst
Total Hydrocarbons (GC)	Not detected	2	08/18/94	08/21/94	TG
Fingerprint based quantification:		14			2
Gasoline	Not detected	0.4	08/18/94	08/21/94	TG
Fuel Oil #2	Not detected	0.4	08/18/94	08/21/94	TG
Fuel Oil #4	Not detected	0.7	08/18/94	08/21/94	TG
Fuel Oil #6	Not detected	0.7	08/18/94	08/21/94	TG
Motor Oil	Not detected	0.7	08/18/94	08/21/94	TG
Ligroin	Not detected	0.4	08/18/94	08/21/94	TG
Aviation Fuel	Not detected	0.4	08/18/94	08/21/94	TG
Other Oil	Not detected	0.7	08/18/94	08/21/94	TG
Unidentified	Not detected		08/18/94	08/21/94	TG

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from petroleum products. Possible match categories are as follows;

Gasoline - includes regular, unleaded, premium, etc.

Fuel Oil #2 - includes home heating oil, #2 fuel oil and diesel.

Fuel Oil #4 - Includes #4 Fuel Oil.

Fuel Oil #6 - includes #6 oil and bunker "C" oil.

Motor Oil - includes virgin and waste automobile.

Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha.

Aviation Fuels - includes Kerosene, Jet A and JP-4.

Other Oil - includes lubricating and cutting oil and silicon oil.

Factors such as microbial degradation, weathering and solubility generally prevent specific identification within a petroleum category. A finding of "unidentified" means that the sample fingerprint was characteristic of a petroleum product, but could not be matched to a fingerprint in the library.

After fingerprint identification, the amount present in the sample is quantified using a calibration curve prepared from a petroleum product of the same category as the identified petroleum. Unidentified petroleum is quantified using a petroleum calibration that approximates the distribution of compounds in the sample. A \* in the results column indicates the petroleum calibration used to quantify unidentified samples.

Laboratory Report

Client ID: MW-5 Lab ID No: AA19732 Location: Commercial Disposal - W.S.

Client Job No.: 12142

Matrix: Water Collected: 08/09/94 by R. HAYNES/ECS Received on 08/09/94 by ATO QC and Data Review by HT Preservative: Refrigeration Container: 1 Amber Glass Liter

Condition of Sample as Received: Satisfactory

Delivered by: Client

# Total Hydrocarbons by GC

#### Modified EPA Method 8100

Parameter	Result (mg/L)	MDL	Extracted	Analyzed	Analyst
Total Hydrocarbons (GC)	Not detected		08/18/94	08/21/94	TG
Fingerprint based quantification	on:	ži.		ä	5//
Gasoline	Not detected	0.4	08/18/94	08/21/94	TG
Fuel Oil #2	Not detected	0.4	08/18/94	08/21/94	TG
Fuel Oil #4	Not detected	0.7	08/18/94	08/21/94	TG
Fuel Oil #6	Not detected	0.7	08/18/94	08/21/94	TG
Motor Oil	Not detected	0.7	08/18/94	08/21/94	TG
Ligroin	Not detected	0.4	08/18/94	08/21/94	TG
Aviation Fuel	Not detected	0.4	08/18/94	08/21/94	TG
Other Oil	Not detected	0.7	08/18/94	08/21/94	TG
Unidentified	Not detected		08/18/94	08/21/94	TG

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from petroleum products. Possible match categories are as follows;

Gasoline - includes regular, unleaded, premium, etc.

Fuel Oil #2 - includes home heating oil, #2 fuel oil and diesel.

Fuel Oil #4 - Includes #4 Fuel Oil.

Fuel Oil #6 - includes #6 oil and bunker "C" oil.

Motor Oil - includes virgin and waste automobile.

Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha.

Aviation Fuels - includes Kerosene, Jet A and JP-4.

Other Oil - includes lubricating and cutting oil and silicon oil.

Factors such as microbial degradation, weathering and solubility generally prevent specific identification within a petroleum category. A finding of "unidentified" means that the sample fingerprint was characteristic of a petroleum product, but could not be matched to a fingerprint in the library.

After fingerprint identification, the amount present in the sample is quantified using a calibration curve prepared from a petroleum product of the same category as the identified petroleum. Unidentified petroleum is quantified using a petroleum calibration that approximates the distribution of compounds in the sample.

A \* in the results column indicates the petroleum calibration used to quantify unidentified samples.

#### Spectrum Analytical, Inc. Laboratory Report Supplement

#### References

Methods for the Determination of Organic Compounds in Drinking Water. EPA-600/4-88/039. EMSL 1988.

Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, EMSL 1983.

Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater. EPA 600/4-82-057. EMSL 1982.

Test Methods for Evaluating Solid Waste. Physical/Chemical Methods. EPA SW-846. 1986.

Standard Methods for the Examination of Water and Wastes. APHA-AWWA-WPCF. 16th Edition. 1985.

Standard Methods for Comparison of Waterborne Petroleum Oils by Gas Chromatography. ASTM D 3328. 1982.

Oil Spill Identification System. U.S. Coast Guard CG-D-52-77: 1977.

Handbook for Analytical Quality Control in Water and Wastewater Laboratories. EPA 600/4-79-019. EMSL 1979.

Choosing Cost-Effective QA/QC (Quality Assurance/Quality Control) Programs for Chemical Analyses. EPA 600/4-85/056. EMSL 1985.

#### Report Notations

Not Detected, Not Det, ND or nd	-	The compound was not de equal to or above the es limit.				
NC	=	Not Calculated				
VOA	= .	Volatile Organic Analysi	is			- 22
BFB	aw	4-Bromofluorobenzene	(an	EPA	624	Surrogate)
p-DFB	=	1,4-Difluorobenzene	(an	EPA	624	Surrogate)
CLB-d5	-	Chlorobenzene-d5	(an	EPA	624	Surrogate)
BCP	=	2-Bromo-1-chloropropane	(an	EPA	601	Surrogate)
TFT	-	a.a.a-Trifluorotoluene	lan	EPA	602	Surrogate)

#### Definitions

Surrogate Recovery = The recovery (expressed as a percent) of a non method analyte (see surrogates listed above) added to the sample for the purpose of monitoring system performance.

Matrix Spike Recovery = The recovery (expressed as a percent) of method analytes added to the sample for the purpose of determining any effect of sample composition on analyte recovery.

Laboratory Replicate = Two sample aliquots taken in the analytical laboratory and analyzed separately with identical procedures. Analyses of laboratory duplicates give a measure of the precision associated with laboratory procedures, but not with sample collection, preservation, or storage procedures.

Field Duplicate = Two separate samples collected at the same time and place under identical circumstances and treated exactly the same throughout field and laboratory procedures. Analysis of Field duplicates give a measure of the precision associated with sample collection, preservation and storage, as well as with laboratory procedures.

Relative Percent Difference (% RPD) = The precision measurement obtained on duplicate/replicate analyses. %RPD is calculated as:

%RPD = <u>|value1 - value2|</u> \* 100% ave, value



# CHAIN OF CUSTODY RECORD

588 Silver Street Agawam, MA 01001 Tel. (413) 789-9018 FAX (413) 789-4076

REPORTS	TO: 0	ECS			100	IN	IVO	ICE	_ T	0:		<	EC	25		_		-				7.1
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#### LIMITATIONS

- The findings set forth in the site assessment report are strictly limited in time and scope to the date of the evaluation, and such findings shall not be used by any one other than client and shall not apply prospectively, and shall not be used for any other purpose than that set forth herein.
- 2) This report contains recommendations which are partially based on the analysis of data accumulated at the time and place set forth in the report through subsurface exploration. However, further investigations may reveal additional data or variations of the current data which may require the enclosed recommendations to be reevaluated.
- The site assessment report provided by Environmental Compliance Services, Inc. herein has made certain interpretations of water level readings in the observation wells at the specific times and under currently existing conditions. This report has summarized these times and conditions, the interpretation, and presents appropriate modifications.
- 4) This report reflects chemical analysis for a practical number of specific parameters which have been previously expressed. However, the report does not express the possible presence of other constituents in the soil and groundwater chemical analysis.
- 5) This report has been prepared in accordance with generally accepted hydrogeologic practices and exclusively for client. No other warranty, express or implied, is made.



# ENVIRONMENTAL COMPLIANCE SERVICES, Inc.

ENVIRONMENTAL SITE ASSESSMENT 115 WAYSIDE AVENUE WEST SPRINGFIELD, MASSACHUSETTS

### Prepared For:

Mr. Robb Townsend Trailerworks, Inc. 13 South Bridge Drive Agawam, Massachusetts,

> File No. 13997 Document No. 18944 August, 2000

MAIN OFFICE: 588 Silver Street Agawam, Massachusetts 01001 Voice: (413) 789 - 3530 Fax: (413) 789 - 2776 2119 West Brandon Bodeyard Suite - K Brandon, Florida 33511 Voice (813) 643 - 8887 Fax (813) 643 - 3847 157 Old Guilford Road Suite - 6 Brattleboro, Vermont 05301 Voice (802) 257 - 1195 Fax (802) 257 - 1603 18 Shepard Street Suite - A Brighton, Massachusetts 02135 Voice: (617) 782 - 4417 Fax: (617) 254-5939



# ENVIRONMENTAL COMPLIANCE SERVICES, INC.

August 11, 2000 File No. 13997,00 Document No. 18944

Mr. Robb Townsend Trailerworks, Inc. 13 South Bridge Drive Agawam, MA. 01001-0506

RE:

Environmental Site Assessment

115 Wayside Avenue

West Springfield, Massachusetts

Dear Mr. Townsend:

Environmental Compliance Services, Inc. (ECS) has completed an Environmental Site Assessment of the commercial property at 115 Wayside Avenue in West Springfield, Massachusetts (the site) (Figure 1, Site Locus). This assessment included: background research at the West Springfield City Offices, West Springfield Fire Department; a review of state and federal environmental databases and files regarding the site and surrounding properties; review of available documentation regarding closure of the site as a Resource Conservation and Recovery Act (RCRA) Transfer, Disposal, Storage Facility (TSDF); and soil and groundwater sampling and analyses. The purpose of this assessment was to render an opinion as to the presence of oil and/or hazardous materials at the site within the provisions of Massachusetts General Laws (MGL) Chapter 21E the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000, and the applicable implementing regulations.

The Site Locus and Site Plan are included as Figure 1 and Figure 2, respectively. Documentation of information gathered as part of this assessment is presented in Attachment I. The New England Data Map report is included as Attachment II. ECS Protocols are included as Attachment III, Soil boring logs as Attachment IV, Groundwater Sampling logs Attachment V, and Laboratory Certificates of soil and groundwater results as Attachment VI. A summary of the findings of the assessment, as well as conclusions and recommendations, are presented within.



Page 2

1.00 - SUMMARY

### 1.10 - Location Description and Setting

The site consists of approximately 2.13 acres of land located approximately 750 feet west of the Connecticut River at the intersection of Wayside Avenue and Town Way in West Springfield, Massachusetts (the site) (Site Locus, Figure 1). The property is listed at the West Springfield Assessor's Office as Parcel Code 499 on Map 81, owned by Commercial Disposal with Waste Management as the parent company. The site is located in a commercial and industrial area with some residential properties located in the vicinity of the site.

Two buildings are located on the site. The building and site are currently vacant but formerly used for the present building, consisting of approximately 14,100 square feet of floor space, is office, warehouse and garage for garage. Utilities available on the site include natural gas, electrical and telephone services, and municipal sanitary sewer and drinking water supply. Surface drainage flows either to a storm drain on-site and abutting roadways toward a drainage pipe that discharges to the north of the site parking areas or into a Connecticut River overflow detention basin located to the north of the site.

Abutting properties include: Capital Insulation to the west; West Springfield flood control property to the north; Bearings Specialty Co., Northeast Precision, A&M Compressed Air Products, Computerland and a residential house located to the south; and Town Way located to the east (Site Plan, Figure 2).

The topography of the site slopes gently from the west down towards the east. A topographic depression associated with a Connecticut River Overflow basin is located directly to the northeast of the site.

### 1.20 - History of Development

According to available historical records, the site has occupied by Commercial Disposal since the mid 1980's. In February 1996 United Waste purchased Commercial Disposal. In August 1997 USA Waste purchased United Waste. In July 1998 Waste Management purchased USA Waste. Waste Management is the parent company of Commercial Disposal which is still exists and is listed as the owner. Prior to that time the site was occupied by Capital Insulation in the 1970s and New England Roto engraving in the 1960s and 1970s. The easterly portion of the site along Town Way formerly supported Legers Rubbish Removal Corp. Division of Waste

Page 3

Management in the 1960s and 1970s. No on-site development was documented prior to the 1960s.

The area of the site was developed for residential use prior to 1930 and remained residential in nature until the 1950s. The southerly abutter at 121 and 123 Wayside Avenue remains as a residential property. Other properties abutting the site have supported commercial and industrial businesses since the 1950s.

#### 1.30 - REGULATORY INFORMATION

1.31 - On-Site

A review of a New England DataMap Corporation report, (Attachment II) and files available at the Western Regional Office of the Massachusetts Department of Environmental Protection (DEP), City of West Springfield Fire Department, and West Springfield City Clerk's Office records revealed the following information:

The site was formerly a Transport, Storage or Disposal Facility (TSDF) as defined by 310 CMR 30.00 Resource Conservation and Recovery Act (RCRA). Storage of hazardous waste on the site was discontinued in 1987.

The facility underwent a RCRA closure study performed by HRP Associates Inc. of Plainville Connecticut. Based on the study a closure certification and change of status form were filed by Commercial Disposal in July 1993. The closure study included the removal of above ground hazardous waste storage tanks and removal of soil from a hazardous waste drum storage area. This area is designated as a previously excavated area on the Site Plan, Figure 2. Groundwater monitoring wells were installed on the site and groundwater samples were obtained for quantitative analyses. Several chlorinated solvents were detected in groundwater on the site.

On January 25, 1994 a letter indicating that the closure satisfied the requirements of 310 CMR 30.587 was issued by the Massachusetts Department of Environmental Protection, Boston, Massachusetts. The letter indicated that no post closure requirements were imposed by the DEP. Groundwater contamination, however, was detected on the site and the letter indicated that the groundwater contamination should be compared to the standards of the



Page 4

Massachusetts Contingency Plan 310 CMR 40.0000.

- The site is not listed on the U.S. EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list, or on the DEP's List of Confirmed Disposal Sites or Locations to be Investigated (LTBI).
- The site was a small quantity generator of waste oil. According to a May 24, 1993 Compliance Inspection of the site, a waste-oil space heater is permitted for use to burn up to 2,000 gallons of waste oil per year on the site. Approximately 1,650 gallons of waste oil were burner on site for heating. The waste oil material is stored in a 250-gallon above ground storage tank. According to the file two parts cleaners are used on site and utilize naphtha for cleaning solvent. No floor drains or wastewater discharges were noted in the area of the waste-oil burner.
- Emergency Response incident reports regarding the site indicate that approximately 30 gallons of diesel fuel was spilled at the site on December 1, 1992. The spill was cleaned by Oil Recovery of West Springfield, MA. The DEP closed this case on December 4, 1992. On July 22, 1993, 20 to 50 gallons of hydraulic oil was released to the site from a hydraulic line on a dump truck. The file indicates that approximately 1.73 tons of absorbent material was used to cleanup this spill. Also, on October 21, 1994, approximately 3 gallons of fuel oil was spilled from an oil delivery truck and on April 30 1986 approximate 5 gallons of diesel was spilled during an overfill of a storage tank. These spills were covered with absorbent and cleaned up by Commercial Disposal.
- One 10,000 gallon underground storage tank on the site failed a tank test in April 1986. The tank was retested and passed the second tank test. The failure of the testing was attributed to an air pressure loss from a manhole which had not been considered.
- Fire department records indicate that the site is currently equipped with (2) 1,000 gallon and (1) 10,000 gallon underground storage tanks. The 1,000 gallon tanks contain hydraulic oil and lubricating oil and the 10,000 gallon tank contains diesel fuel. These tanks were installed in 1989. Tanks with an approximately capacity of 14,000 gallons were removed from the site in 1988 and 1989. No indication of a release from these tanks was noted in fire department files.



Page 5

 A review of the DEP/Mass GIS Map for Natural Resources/Western Region indicated that the site and vicinity are mapped as an area underlain by a mediumyield aquifer which is considered potentially productive. No public water supply is located in the vicinity of the site.

1.32 - Off-Site

There are no locations within a one-mile radius of the site which appear on the USEPA CERCLIS list.

There are two locations in the immediate vicinity of the site that are on the DEP's Transitioned and Tier Classified Sites. Former Sanford Tool at 79 Wayside Avenue and property located at 35 Doty Circle both located approximately 200 feet west of the site. (Attachment I).

Leaking underground storage tank incidents have occurred at the UPS facility to the south of the site across Wayside Avenue and at 124 Ashley Avenue which is approximately 0.3 of a mile to the south of the site. No emergency response incidents were indicated on abutting sites. The UPS facility across Wayside Avenue had a release to floor drains on there property which discharged to the Connecticut River (Attachment I).

Brinks at 35 Doty Circle, Standard Industrial Supply 154 Wayside Avenue and UPS at 120 Wayside Avenue have been licensed for underground storage tanks.

1.40 - Site Visit

The site visit was performed by Mr. Karl M. Dietzler on July 31, 2000. The following general observations were made during the site visit:

- The on-site buildings are comprised of a one-story concrete block office building and a one-story maintenance garage building. The site buildings were recently occupied by Waste Management/Commercial Disposal. Trucks associated with the solid waste transporting were parked on the northeastern portion of the site.
- A paved parking area is located to the east of the office building and the majority of the site is either paved or covered by buildings.

Page 6

- The current heating method utilized for the office building was natural gas. Natural
  gas was also used to fuel the heating system in the garage building and was
  supplemented by a waste oil-burning heater for which the DEP has issued a
  permit. Waste oil generated from the maintenance of vehicles on the site was
  stored and burned in bay 6 as depicted on the site plan, Figure 2.
- Oils and hazardous materials related to the businesses were stored on site inside
  the building area (Attachment I). Sanitary waste generated on the site was
  discharged to the municipal sewer system. Floor drains within the site building
  discharge to an oil/water separator, which is connected to the municipal sewer
  system.

#### 2.00 - FIELD INVESTIGATIONS

### 2.10 - Investigatory Approach

Four of five groundwater monitoring wells located on or near the site were accessed, sampled and samples were analyzed to evaluate the potential presence of oil or hazardous material in the environment of the site. A fifth monitoring well, designated MW-5 could not be located by ECS. Previous investigations indicated that these sampling locations are downgradient to potential sources of oil or hazardous material on the site. The locations of monitoring wells were approximated from available information on the Site Plan, Figure 2.

Several soil borings were completed on the site to address potential sources of contamination. Borings EP-2 through EP-4 and EP-9 were situated in the vicinity of an active 10,000 gallon diesel UST. Borings EP-5 through EP-7 were situated in the vicinity of (2) 1,000 gallon USTs. Boring EP-8 was situated in the vicinity of an oil/water separator.

# 2.20 - Methodology

# 2.21 - Drilling Procedures and Subsurface Sampling

Soil borings on July 25 and 28, 2000 were advanced by using a truckmounted, hydraulically assisted probe-system. Soil samples were collected at designated intervals by direct push methods using a clean, decontaminated, 48-inch long nickel-plated sampler containing a dedicated 1.50-inch diameter PETG clear plastic liner. The liner was



Page 7

removed from the sampler and cut open in the field with a decontaminated knife for sample screening and collection. Soil samples were visually characterized, logged, and examined for abnormalities indicative of contamination as would be evidenced by an unusual odor, texture, or color. Representative portions of each soil sample were collected in duplicate 8-ounce glass jars with an aluminum-foil seal placed beneath the screw cap for field screening for the presence of Total Organic Vapors (TOVs) in headspace. Boring logs are included in Attachment IV.

### 2.22 - Soil Screening Procedures

Soil samples were screened for TOVs using an H-Nu Systems Photoionization Organic Vapor Detector Model PI-101 equipped with a 10.2 eV lamp (calibrated as benzene). The method detection limit of the instrument is 0.2 parts per million (ppm). The probe of the instrument was inserted through the aluminum foil seal on the soil jars for headspace vapor screening after permitting development and equilibration of the sample at ambient temperatures. Soil screening protocols are presented in Attachment III. Based upon the results of TOVs, three subsurface soil samples were submitted for quantitative laboratory analysis.

# 2.23 - Groundwater Sampling

On July 24 and August 8, 2000, monitoring wells were gauged for depth to water and total depth using a decontaminated electronic water level indicator. The volume of standing water in each well was calculated and between three and five well volumes of groundwater were purged from each well using low flow sampling techniques on July 24, 2000 and using pre-wrapped, disposable plastic bailers suspended with virgin polypropylene rope on August 8, 2000. Groundwater samples were collected in duplicate 40 milliliter (ml) teflon-septa vials for Volatile Petroleum Hydrocarbon (VPH) and volatile halocarbon analysis, and in one liter glass containers for Extractable Petroleum Hydrocarbon (EPH) analysis. All samples were collected and submitted in accordance with MADEP and modified USEPA methodologies. These analyses were selected due to past property uses. Samples collected for VPH and EPH analyses were preserved with concentrated hydrochloric acid to achieve a pH less than 2 in the sample. All samples were refrigerated on-site and during transport to a Massachusetts-certified laboratory following chain of custody protocol.



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A sample from each monitoring well was collected for on-site measurement of temperature, pH, and specific conductance, and to permit observation of pertinent characteristics such as the presence of an odor or a sheen (Groundwater Sampling Logs Attachment V).

### 2.30 - Results and Discussion

### 2.31 - Soil Screening Results

Significant levels of TOVs were encountered in soil samples collected from soil borings EP-2, EP-4 and EP-9 which were located on the south and east side of the 10,000 gallon UST.

TOVs in EP-2 ranged from 1,300 parts per million (ppm) in the 6-8' interval to 0.2 ppm in the 0-2' interval.

TOVs in EP-4 ranged from 100 ppm in the 2-4' interval to 1.2 ppm in the 8-10' interval.

TOVs in EP-9 ranged from 170 ppm in the 2-4' interval to Below Detectable Levels (BDL=<0.2ppm) in the 14-16' interval.

### 2.32 - Quantitative Soil Results

Soil samples were submitted from borings EP-9 (12-14'), EP-2 (6-8'), and EP-4 (2-4') for VPH and EPH analysis. Concentrations of VPH (C9-C10 aromatics) and VPH target analytes (napthalene) were detected above in EP-9 (12-14') above Reportable Concentrations according to the Massachusetts Contingency Plan (MCP-310 CMR 40.1600) for category RCS-1, applicable to the site.

Concentrations of VPH (C5-C8 aliphatics and C9-C10 aromatics), VPH target analytes (naphthalene), EPH (C9-C18 aliphatics and C11-C22 aromatics), and EPH target PAH analytes (naphthalene and 2-methylnaphthalene) were detected in EP-2 (6-8') above RCS-1 standards.

Concentrations of VPH target analytes (naphthalene) were detected in EP-4 (2-4') above RCS-1 Standards.



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Soil results are summarized in Table 1 are included in Attachment VI.

### 2.33 - Quantitative Groundwater Results

Detectable concentrations of Tetrachloroethene were present in the groundwater samples collected from wells MW-2 and MW-4. Concentrations in both wells were 1.4 micrograms per liter (ug/L), well below the RCGW-2 standard of 3,000 ug/L.

No concentrations of volatile hydrocarbons were detected in wells MW-1 and MW-3. No concentrations of VPH, VPH target analytes, EPH or EPH target PAH analytes were detected in MW-1, MW-2, MW-2, MW-3, and MW-4.

#### 3.00 CONCLUSIONS & RECOMMENDATIONS

#### 3.10 - Conclusions

During this environmental site assessment, no evaluation of the presence of lead paint, urea formaldehyde foam insulation, or asbestos containing materials was performed on the site. A limited program of groundwater sampling and analyses was performed on the site to assess the condition of the site with respect to oil or hazardous material. Groundwater samples were obtained from monitoring wells installed by others as part of a previous study. The conclusions made in this report are limited according to these qualifications.

Based on the information obtained during this assessment, it is the opinion of ECS that soil contamination is present on the site in the vicinity of a 10,000 gallon diesel UST. Contaminants detected in soil exceed RCS-1 Standards and therefore trigger a 120 day reporting requirement to the DEP. The groundwater concentrations of tetrachloroethene in monitoring wells MW-2 and MW-4 are well below the RCGW-2 standards applicable for the subject site.

No other areas of concern were identified during the performance of this assessment.

### 3.20 - Recommendations

ECS recommends the excavation of proper disposal of contaminated soils in the immediate vicinity of the 10,000 gallon diesel UST. These activities will most likely trigger DEP notification before the 120 day requirement and warrant UST removal.

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If there are any questions concerning this information, please do not hesitate to contact our office.

Sincerely,

ENVIRONMENTAL COMPLIANCE SERVICES, INC.

Karl M. Dietzler

Environmental Analyst

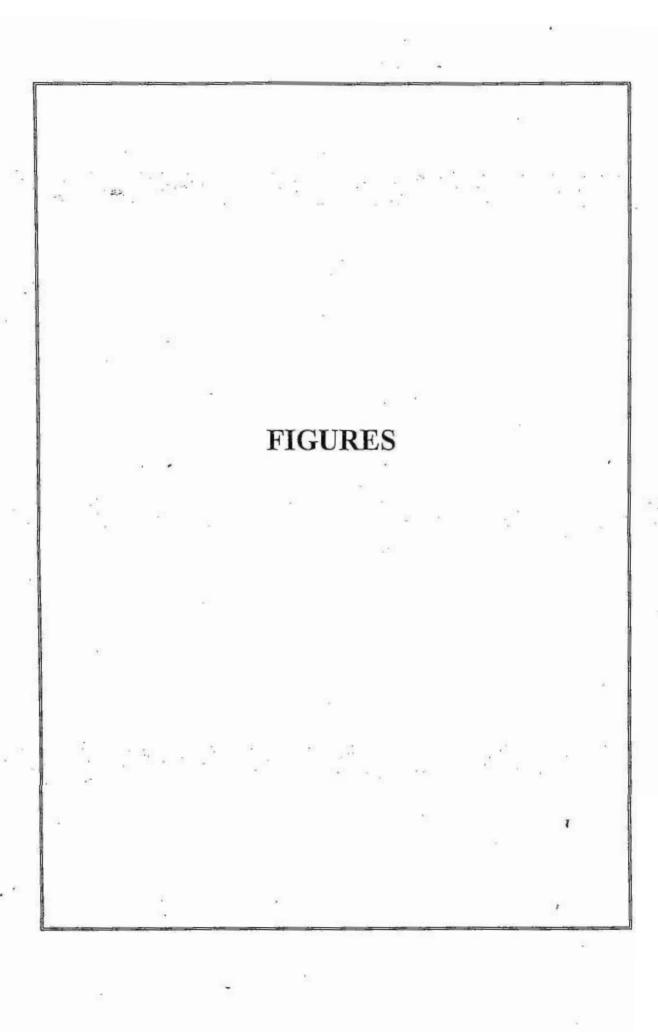
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Mark A. Haynes V

Senior Project Manager

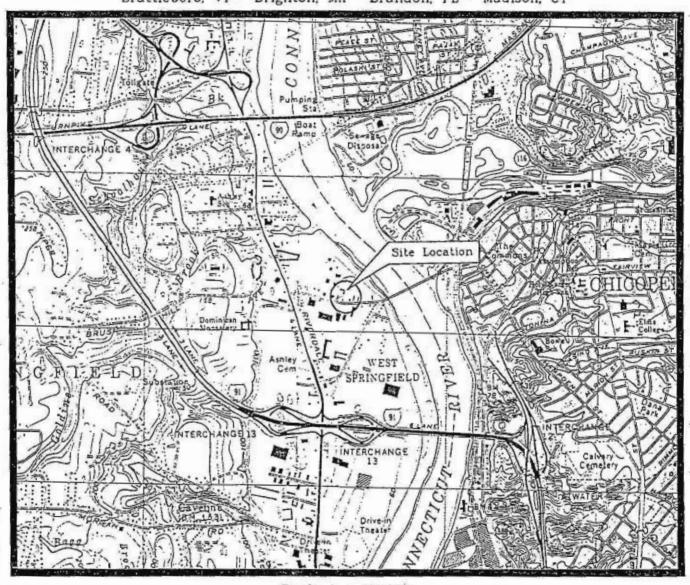
KMD/MAH/kb Attachments





# ENVIRONMENTAL COMPLIANCE SERVICES, INC.

588 Silver Street \* Agawam, MA 01001 Brattleboro, VT \* Brighton, MA \* Brandon, FL \* Madison, CT



Scale 1: 25,000

Contour Interval 10 Feet

Base Map: U.S. Geological Survey; Quadrangle Location: Springfield North, MA

Map Edited: 1964

Photorevised: 1979

Photoinspected: None

North

Commercial Disposal Co. Inc.

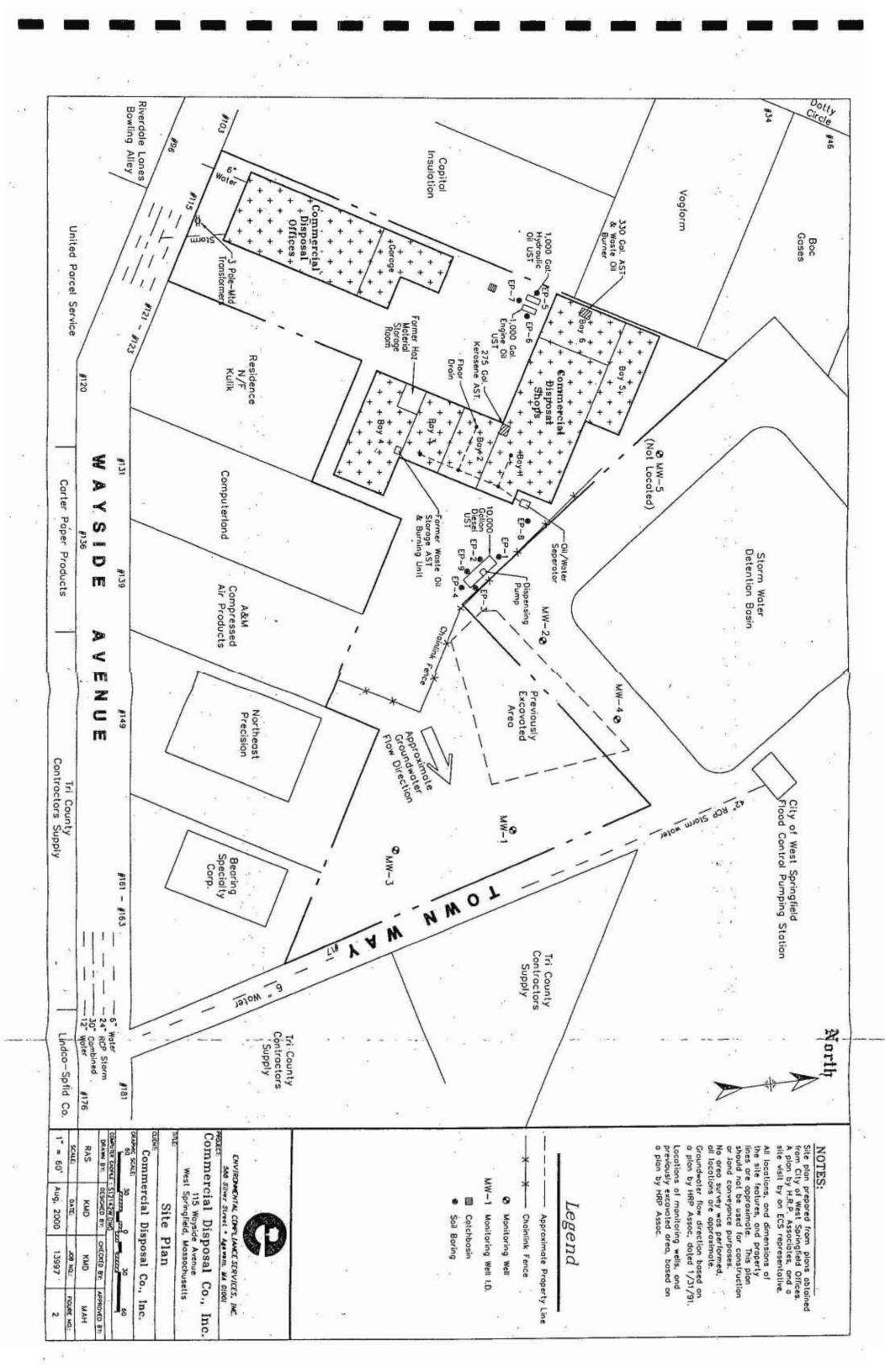
115 Wayside Avenue West Springfield, Massachusetts AutoCAD File: L13997.DWG

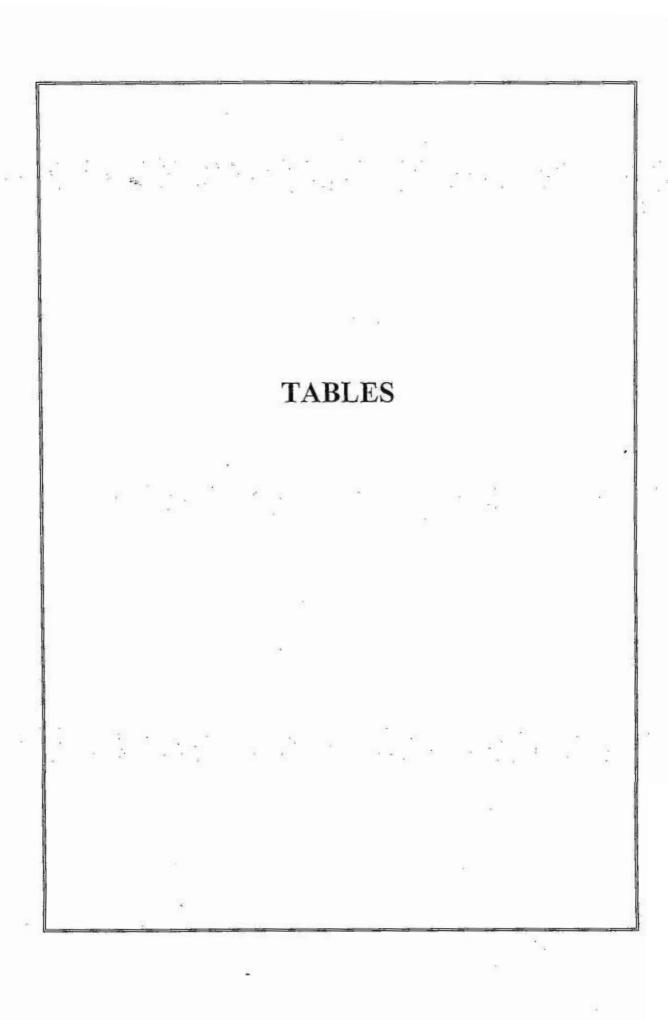
Figure - 1

1 Mile

Site Locus

Job No.: 13997





### Table 1

### 115 Wayside Avenue West Springfield, Massachusetts Job#13997

### Concentrations of Volatile Petroleum Hydrocarbons (VPH), Extractable Petroleum Hydrocarbons (EPH), and

Volatile Organic Compounds (VOC)

or Soil

	Method	for MADEP MADEP VP	Soil H 97-12 and MADEP	EPH 98-1)
Sample Location	EP-9 12-14'	EP-2 6-8'	EP-4 2-4'	Reportable Concentrations <sup>(2)</sup>
Sampling Date	7/28/00	7/25/00	7/25/00	RCS-I
VPH Aliphatics/Aromatics (mg/Kg) <sup>(1)</sup>		Maria de la composición dela composición de la composición de la composición dela composición dela composición dela composición de la composición de la composición de la composición dela composición de la composición dela composición de		1 1025
C5-C8 Aliphatics Hydrocarbons	36	108	ND/3.39	100
C9-C12 Aliphatics Hydrocarbons	39	386	26	1,000
C9-C10 Aromatics Hydrocarbons	100	520	39	100
VPH Target Analytes (ug/Kg) <sup>(1)</sup>		V/4 %		
Benzene	ND/720	ND/800	ND/230	10,000
Ethylbenzene	3,800	14,400	ND/230	80,000
Methyl-tert-butyl ether	ND/720	ND/800	ND/230	300
Naphthalene	7,600	48,000	4,900	4,000
Toluene	ND/720	ND/800	ND/230	90,000
m,p-Xylenes	10,600	41,600	ND/450	500,000
o-Xylenes	5,400	20,000	ND/230	500,000
EPH Aliphatics/Aromatics (mg/Kg)(1)	A to Ave			
C9-C18 Aliphatics Hydrocarbons	ND/30	1,300	ND/30	1,000
C19-C36 Aliphatics Hydrocarbons	ND/30	250	39	2,500
C11-C22 Aromatics Hydrocarbons	ND/30	1,299	ND/30	200
EPH Target PAH Analytes (ug/Kg) <sup>(1)</sup>			7.5	
Naphthalene	ND/150	27,000	ND/160	4,000
2-Methylnaphthalene	ND/150	37,000	ND/160	4,000
Acenaphthylene	ND/150	380	ND/160	100,000
Acenaphthene	ND/150	370	ND/160	20,000
Fluorene	ND/150	800	ND/160	400,000
Phonanthrene	ND/150	2,000	ND/160	100,000
All Other Compounds	ND	ND	ND	N/A

NOTES: ND = Not detected at the method detection limits.

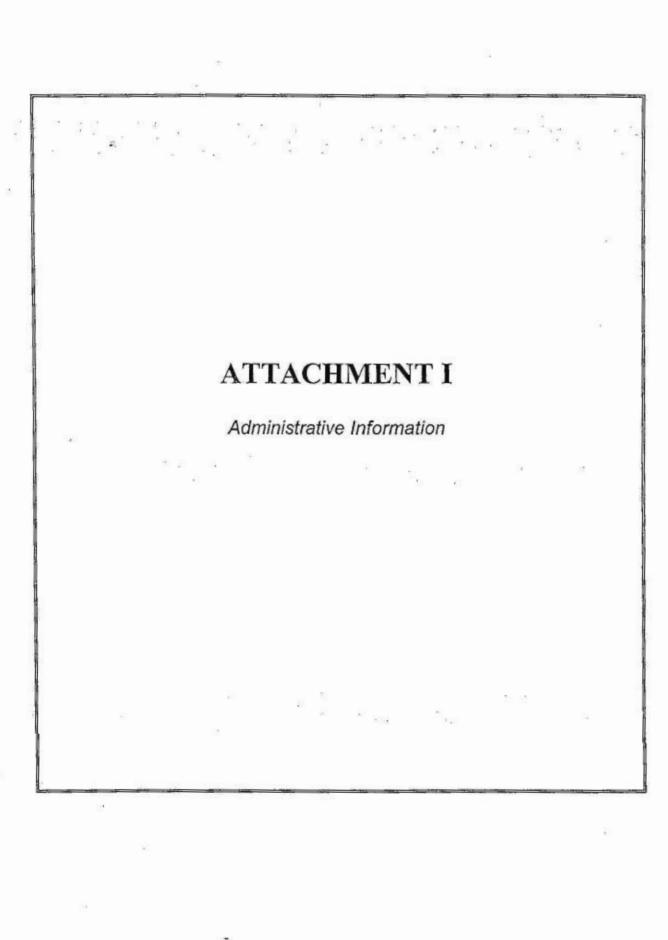
N/A= Not Applicable.

Bold = Concentrations Above Standards.

<sup>&</sup>lt;sup>1</sup>Milligrams per liter (mg/Kg) or micrograms per liter (ug/Kg) as noted.

<sup>&</sup>lt;sup>2</sup>MCP Reportable Concentrations (RCs) pursuant to 310 CMR 40.1600

<sup>&</sup>lt;sup>3</sup>Standard for Total Xylenes.



### ADMINISTRATIVE INFORMATION

DATE STARTED:	July 12, 2000	DATE COMPLETED: August 11, 2000	53.73
CLIENT:	Trailerworks, Inc.	SITE: former Commercial Disposal and Waste Mana	gement
CLIENT ADDRESS:	115 Wayside Avenue	ADDRESS: 115 Wayside Avenue and 17 Town Way, West Springfield, Massachuset	ts
CLIENT CONTACT: PHONE:	Mr. Robb Townsend (413) 789-7794	CONTACT ON SITE:  PHONE:	77-3
CLIENT FILE NO.			
SECTION SECTION	1 - SITE LOCATION & SETTING 12 - LOCAL RECORDS REVIEW AND INTERVIEWS WITH LOCAL OFFICIALS 13 - LOCAL HISTORY 14 - FEDERAL ENVIRONMENTAL RECORDS 15 - STATE ENVIRONMENTAL RECORDS 16 - SITE VISIT		
		STATE: Massachusetts	
×		NEAREST INTERSECTION / CROSS STREET:  Wayside Avenue and Doty Circle	
		1	_
CONFIDENTIALITY:		-	
	Standard		

### SITE LOCATION

USGS QUADRANGLE MAP: Springfield-North

LATITUDE:

42.144626

LONGITUDE:

72.626185

UTM COORDINATES:

4668347.785N

696159.032 E

#### LOCATION OF SITE RELATIVE TO LANDMARKS:

The site is located approximately 2,900 feet north of the Route 91, Route 5 interchange in West Springfield and about 750 feet west of the Connecticut River.

### SITE SETTING

#### REGIONAL DEVELOPMENT:

The area to the northwest, west, south and southeast is primarily associated with light industrial and commercial enterprises. The area to the north and northeast contain flood control dikes and stormwater pump stations.

#### REGIONAL TOPOGRAPHY:

Regional topography is flat, given the areas location in the Connecticut River Flood Plain.

#### **ELEVATIONS:**

Based on USGS Topographical Maps, the area is at an approximate elevation of 60 mean sea level with the Connecticut River being at approximately 49 feet.

#### REGIONAL DRAINAGE:

Storm runoff in this area is collected by sewer and is charged into the Connecticut River at the end of Wayside Avenue.

#### SURFACE WATER:

### Surface Water On-site:

No surface water bodies are located on site.

### Surface Water Adjacent to the site:

No surface water is located adjacent to the site.

Note: A stormwater detention area just over the northern border is normally dry, except in extreme storm events.

#### WETLANDS

#### Wetlands On-site:

None indicated.

### Wetlands Adjacent to the Site:

None indicated.

#### WETLANDS INVENTORY MAPS:

Name of Map: Springfield-North, Mt. Tom

Date: October, 1975

### FLOODING POTENTIAL

#### ON AND IN THE VICINITY OF THE SITE:

The site is located in the Connecticut River Flood Plain. However, it is protected by an extensive series of dike built by the Army Corps of Engineers in the late 1930s and early 1940s.

#### FLOOD INSURANCE RATE MAP (FIRM):

The site is located in Zone C, an area of minimal flooding, per FIRM Map #250155 0001 C, 10/11/1979

#### SITE GEOLOGY:

SOILS:

#### Classification:

UH - Urban Land Hadley Winooski Association

#### Characteristics:

Soils are deep and moderately drained, slopes are 0 to 8 percent. Surface layer is friable, dark graybrown loam for 12 inches. Substratum is to a depth of 60 inches. Alternating layers of olive silt and find sand with gray and yellow-red mottles. Permeability is high, as is water capacity.

#### Information Source:

Sheet 17, Page 52 - USDA Soil Conservation Service, Soil Survey of Hampden County, Central Part, issued May of 1978.

#### SURFICIAL GEOLOGY:

Sand deposits and fine deposits, undifferentiated.

### Estimated Thickness:

Unknown.

### Information Source:

Map showing distribution and thickness of the principal fine grain deposits, Connecticut Valley Urban Area, Central New England, by William H. Langer, Map I-1074-C, Sheet 2 of 2.

#### BEDROCK GEOLOGY:

#### Description:

Hartford Basin, Portland Formation (Lower Jurassic). Reddish-brown to pale red arkose and siltstone, and gray sandstone, gray siltstone, and black shale interpreted as lake beds.

#### Information Source:

Bedrock Geologic Map of Massachusetts, E-an, Zen, Editor, 1983.

### ASSESSORS OFFICE:

Contact:

Date:

Time:

Personnel

July 31, 2000

1:00-1:15 pm

PRESENT OWNER OF RECORD:

Commercial Disposal Company, Inc.

DATES OF PURCHASE:

June 1, 1978 and October 1, 1981

LISTED ADDRESS:

600 New Ludlow Road

South Hadley, Massachusetts 01075

MAP AND PARCEL NUMBER(S):

Map 81, Parcel 499

Map 81, Parcel 514

DEED BOOK AND PAGE:

5614/80

4614/80

5177/301

AREA:

2.13 Acres in Parcels

HEAT SOURCE:

Gas forced hot air.

UTILITY SERVICES ON-SITE: Gas, electricity, sewer, telephone, and water.

Notes:

Document: Section.2 Local Records Review and Interviews With Local Officials

	ASSESSOR'S OFFICE INFORMA	TION	
	BUILDINGS OR STRUCTURES O	N SITE	
LOCATION	Construction	NUMBER OF FLOORS	AREA (SQUARE FEET)
115 Wayside Avenue	Masonry Construction	1	Not Specified
17 Town Way	Masonry Construction	1	Not Specified

		Assi	ASSESSOR'S OFFICE INFORMATION	REMATION	
			ABUTTING PROPERTIES	TIES	
OWNER NAME/ ADDRESS	MAP AND PARCEL NUMBER	LOCATION OF PROPERTY RELATIVE TO SITE	USE	COMMENTS (WATER SUPPLIES, SEPTIC, ETC., LOCATION RELATIVE TO SITE)	* _ 6.
William Parentau 103 Wayside Avenue	81-514	Southwest	Commercial	All developed properties in the vicinity of the site are presumed to be connected to all public utilities.	onnected to all
Nellie A. Kulik 121-123 Wayside Avenue	81-514 3200 0081	South	Commercial		ū.
E & L Realty Corporation 139 Wayside Avenue	81-514 3200 0081	South	Commercial		
Robert J. Healy 149 Wayside Avenue	3300 0081	South	Commercial		8
Robert J. Healy 161 Wayside Avenue	3400 0081	South	Commercial		
Robert Clark, Jr. 181 Wayside Avenue	33\$0.0080A	South	Commercial		
Hurley & Johnson 34 Doty Circle	\$1-221 8700 0081	West	Commercial		-
Rena R. Jaeger, Jr. 46 Doty Circle	\$1 - 221 8750 0081	West	Commercial		
Town of West Springfield Flood Control Dike Town Way		North	Flood Control		S 37
					227

E

Document: Section.2	
Local Records Review and Interviews	
With Local Officials	

### BUILDING INSPECTORS / ENGINEERING OFFICE

Contact:

Date:

Time:

Personnel

July 31, 2000

3:45-4:00 pm

			FFICE / ENGINEERING OFFICE	
BUILDINGS / STRUCTURES	LOCATION ON SITE	AGE	CONSTRUCTION	COMMENTS
Offices	115 Wayside Avenue	Not Specified	Concrete Block	
Garage	West End of Town Way	Not Specified	Concrete Block	

Notes: Building Department has following permits on file for Commercial Disposal: November 29, 1988, Rebound Storage Building damaged by fire, 250 feet off road, heated by gas; October 9, 1984, New storage at 17 Town Way, no heat.

	Section.2		Project Number 12142A.21E
	ords Review and Inte al Officials	rviews	August 15, 2000 Page 10
	a Ottoriais		105010
UTILITY	- 1 24	Availability (on-site):	e e e e e e e e e e e e e e e e e e e
	Water:	Yes	
	Sewer:	Yes	
	Stormwater:	Yes	
	Electric:	Yes	
ki .	Gas:	Yes	
UTILITY	CONNECTIONS /	AVAILABILITY (IN STREET):	
	Water:	Yes	
	Sewer:	Yes	
20	Stormwater: Electric:	Yes	

Gas:

Yes

Document:	Section.2
Donativité.	Controlling.

Local Records Review and Interviews

With Local Officials

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# ZONING COMMISSION / PLANNING BOARD:

Contact:

Date:

Time:

Personnel

July 31, 2000

4:00-4:15 pm

SITE ZONING:

Designation:

Business B: Across street is industrial park.

Effective Date:

1989

ADJACENT PROPERTIES:

Designation:

Industrial Park (IP)

Effective Date:

1989

PREVIOUS DESIGNATIONS (WITH DATES AND LOCATIONS RELATIVE TO SITE):

Unknown.

ANTICIPATED CHANGES:

On-Site:

None

Neighboring Properties:

None

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ocal Records Review and Interviews	
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# CONSERVATION COMMISSION:

The Conservation Commission was not contacted as part of the present assessment

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Local Records Review and Interviews

With Local Officials

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### HEALTH DEPARTMENT:

Contact:

Date:

Time:

Peg Mc Grady

July 31, 2000

3:30-3:45 pm

WATER SUPPLIES:

On-Site: West Springfield Municipal System

Testing: No testing information was reviewed.

Off-Site: West Springfield Municipal System

NATURE AND LOCATION OF MUNICIPAL WATER SUPPLY:

Southwick Wells and Bearhole Reservoir

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Local Records Review and Interviews	5
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	******

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# TOWN CLERK'S OFFICE

Contact:

Date:

Time:

Gwen Keough

July 31, 2000

3:45-4:00 pm

PERMIT	LISTING SEAR	TOWN CLERK'S OFFICE CH DISTANCE ON-SITE AND NEI	GHBORING PROPERTIES
DATE OF REVIEW:	JULY 31, 200	0	
LOCATION	DATE	PERMIT TYPE	COMMENTS
United Parcel Service 120 Wayside Avenue	11/23/65 11/23/65	700 Gallons AST 15,000 Gas & Diesel UST	10/23/91 Removed one 4,000-gallon diesel tank, one 1,000-gallon oil tank, one 550-gallon waste oil tank, two 4,000-gallon gasoline tanks, and one 550-gallon waste oil tank.  Installed one 15,000-gallon diesel and two-10,000-gallon gasoline tanks.  8/17/93 Removed one 10,000-gallon diesel tank.
Tri-County Contractors 154 Wayside Avenue	6/28/60	4,000 Gallons Gasoline	8/21/97 Filled 4,000-gallon tank with cement slurry.
Brinks, Inc. 35 Doty Circle	8/19/70	1,000 Gallons AST 4,000 Gallons UST	8/29/88 Removed one 4,000-gallon UST.

Notes: AST - Above Ground Storage Tank

UST - Underground Storage Tank

Local Records Review and Interviews	
With Local Officials	

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FIRE DEPARTMENT:

Contact:

Date:

Time:

Lou Lamothe

August 1, 2000

9:00am-9:30am

	UNDERGROUND	STORAGE TAN	FIRE DEPARTMENT FILE REVIEW KS SEARCH DISTANCE ON-SITE /	CE REVIEW ON-SITE AND	NEIGHBORING P	ROPERTIES	
LOCATION	SIZE (GALLONS)	CONSTRUCTION	CONTENTS	AGE (YEARS)	INSTALLED	REMOVED	COMMENTS (CATHODIC PROTECTION, REPAIRS AND DATES, RELINING (DATE), NOTICE OF LEAKS (DATES), TRANSFER LINES AND PIPING)
17 Town Way	3,000 1,000 10,000 1,000 1,000	S S S S S S S S S S S S S S S S S S S	NS NS NS Oil Hydraulie Oil Diesel	A A A A A A	27/71/21 27/71/21 27/21/21 28/25/8 28/25/8	10/10/86 11/18/88 8/28/89 N/A N/A N/A	No record of release .  No record of release .  No record of release .  NS  NS  NS
35 Doty Circle	4,000	SN	Gasoline	NA	8/19/70	4/22/88	Tank failed tightness test but no evidence of release noted upon removal of tank.
154 Wayside Avenue	4,000	NS	No. 2 Fuel Oil	34	6/28/60	N/A	**
120 Wayside Avenue	15,700 4,000 1,000 (2) 550 15,000 (2) 10,000	S S S S S S	NS Diesel No. 2 Fuel Oil Waste Oil NS	29 N/A N/A N/A 3	11/23/65 NS NS NS NS 11/29/91	N/A 9/23/91 9/23/91 9/23/91 N/A N/A	Water readings indicated possible problems.  These tanks for diesel and gasoline.

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# FEDERAL ENVIRONMENTAL RECORDS

CERCLIS L - 8 LISTINGS (USEPA COMPREHENSIVE ENVIRONMENTAL RESPONSE, SEARCH DISTANCE:

NO CERCLIS sites are located within 1 mile of the site.

Downment	 A
I DOVERNI PROPERT	 finn 4

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Federal Environmental Records

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### U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA)

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) LIST OF HAZARDOUS MATERIALS HANDLERS/GENERATORS

TSD = 1.0 MILES
GENERATORS - ON-SITE AND NEIGHBORING PROPERTIES:

The site is listed as a TSD facility but is awaiting a change of status. The site is also listed as a small quantity generator of hazardous waste.

### MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

### EMERGENCY RESPONSE (ER) FILE REVIEW

### SEARCH DISTANCE ON-SITE AND NEIGHBORING PROPERTIES

FILE LOCATIONS (TOWNS): WEST SPRINGFIELD

FILE DATES: AS SPECIFIED

DATE	EVENT DESCRIPTION	LOCATION (RELATIVE TO SITE)
93	No Emergency Response on record.	
5/20/93	74 Wayside Avenue (Mikes Wholesale Bait) Former Sanford Tool - Possible Unsafe Use of formaldehydes reported investigated (unfounded) W93-264. OSHA asked to investigate.	200 feet west.
8/28/91	Report of truck discharging milky white substance to storm drain (or Wayside and Doty Circle).  Investigated, case closed.	200 feet west.
10/30/90	Booms in river from United Parcel Service. Spill not working right, storm system will be flushed by O.R. Cote to cleanout.	United Parcel Service is south across Wayside Avenue.
7/8/93	United Parcel Service changing floor drains to town sewer. No problem.	Site No.
12/4/72	17 Town Way - Bill of Lading No. 818 issued to dispose of four drums of Kwick Wick at Vicon Recovery. O.R. diesel spill.	Site No. On-site
12/01/92	17 Town Way - Thirty gallons diesel to pavement, nozzle feil out of tank.	On-site (case closed)
8/26/92	GES while working on another job United Parcel Service floor drains and notify DEP.	
88 - 89	Nothing.	
12/5/87	130 Doty Circle - Fifty gallons hydraulic fluid from rubbish truck.	200 feet west.
10/21/80	Wayside fuel from delivery truck spilled three gallons. Speedi-dry.	On-site
4/20/86	17 Town Way - Five gallon overfill speedi-dry.	On-site

#### MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

#### LEAKING UNDERGROUND STORAGE TANKS FILE REVIEW

#### SEARCH DISTANCE 0.5 MILES

FILE LOCATIONS (TOWNS): WEST SPRINGFIELD

FILE DATES: AS SPECIFIED

DATE	EVENT DESCRIPTION	LOCATION (RELATIVE TO SITE)
1/27/88	Waste oil overflowed UST. Cyn cleaned.	124 Ashley Avenue 0.3 miles south.
6/6/89	Oil out of storm drain into river from United Parcel Service diesel small overfill	United Parcel Service is across Wayside Avenue to the south.
4/30/86	Commercial Disposal - 10,000 gallon No. 2 diesel test failed tight test	149 Wayside Avenue abutter to the south.
5/15/86	Air released from buried manhole and retested without air interface. Passed (DEP notified by Nancy Frantoni, Compliance Manager, letter sent to West Springfield Fire Department on April 30, 1986.	On-site.

Document:	Section.5
State Enviro	nmental Records

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## DEPARTMENT OF ENVIRONMENTAL PROTECTION

STATE LANDFILL OR SOLID WASTE DISPOSAL SITES:

No landfills or solid waste disposal sites were noted within 0.5 miles of the site.

		ENT OF ENVIRONMENTAL PROTECTION SITES FILE REVIEW	
LOCATIONS OF I	FILES (TOWNS): WEST SPRINGFIE	LD	
SITE NUMBER	ADDRESS	LOCATION (RELATIVE TO SITE)	CITATION
10929	Exxon Station 1247 Riverdale Street	0.4 miles southwest of the site.	Phase II, RAO
10898	Red's Exxon 1528 Riverdale Street	0.3 miles northwest of the site.	Phase II, RAO
10710	Sanford Tool 79 Wayside Avenue	200 feet west of the site.	Phase II, NFA
1-0464	35 Wayside Avenue	200 feet west of the site.	NFA

Document: Section.5	
State Environmental Records	

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## WATER SUPPLY OVERLAYS

QUADRANGLES CHECKED;

West Springfield

SITE QUADRANGLE:

West Springfield

AQUIFER TYPE:

On-site:

M<sub>9</sub> - Capable of yielding 1 to 1,000 gallons per minute to individual wells.

Adjacent to site: Ma

WATER SUPPLIES:

No public water supplies were noted within 1 mile of the site.

CONTAMINATION SOURCES:

A salt storage facility was noted within 0.5 miles southwest of the site.

Document: 5	Section.1
Sit-Location	and Setting

SITE VISIT:

PERFORMED BY:

Mr. Karl M. Dietzler

ACCOMPANIED BY:

DATE PERFORMED:

July 31, 2000

CURRENT USE OF SITE:

Vacant

FORMER USE(S) OF SITE:

Offices and garage for Commercial Disposal. Some space is also utilized by Oil Recovery Corporation.

#### DEVELOPMENT:

#### Buildings:

Two buildings are located on-site. One building is located close to Wayside Avenue and was utilized as an office building. The second building is a garage building last used for maintenance of Commercial Disposal and Oil Recovery vehicles. This building is approximately 200 feet from Wayside Avenue.

#### Evidence of Former Buildings/Structures:

No evidence of former buildings was noted during the site visits.

#### CURRENT HEATING METHOD:

The office building is heated a natural gas system. The garage building is also heated by a natural gas system which is supplemented by a waste oil burning heating system located in Bay 6.

#### Evidence of Former Heating Method(s):

No evidence of former heating methods was noted during the site visit.

#### WASTE DISPOSAL:

No evidence of current a former waste disposal methods were noted during the site visit.

#### ROADWAYS:

Access to the site is gained from either Wayside Avenue to the south of the site or Town Way located to the east of the site.

#### PARKING AREAS (PAVEMENT, ASPHALT/CONCRETE, CONDITION, AREA AND LOCATIONS COVERED):

Parking for cars along east side of the office building. Parking for trucks in the paved area to the east of the garage building.

#### CATCHBASINS (STORMWATER):

One stormwater catch basin is located between the office building and Bay 6 of the garage building.

#### UTILITIES ON SITE:

The site is serviced by natural gas, electricity, telephone, municipal water and municipal sewer connections.

#### Utilities Formerly on Site:

No evidence of former utilities was noted on the site.

#### WELLS (DRINKING/INDUSTRIAL/IRRIGATION) PRESENT ON SITE:

Four of five groundwater monitoring wells installed by HRP Associates were located on the site.

#### FENCING (ACCESS LIMITATIONS):

Fencing is located along the site boundary to the east and north between the site and West Springfield Flood Control property.

#### EVIDENCE OF FILLING/EXCAVATION:

An area of the site has been excavated, filled and paved as part of a RCRA closure of the site, however, no evidence of the excavation was noted during the site visit.

#### OIL AND HAZARDOUS MATERIALS CURRENTLY USED / STORED ON-SITE:

Waste oil containers and a waste oil burner were observed in Bay 6 of the garage building. This waste oil and burner supplements the gas fired heating system. Various automotive repair fluids were utilized in the garage building. One 500-gallon kerosene above ground storage tank in Bay 1 is used to fuel a steam cleaner which is used to clean vehicles. Three underground storage tank (UST) are located on the site. One 10,000-gallon UST (diesel) and two 1,000-gallon USTs (hydraulic oil and engine oil) are located on the site.

#### FACILITIES PRESENT (ON-SITE):

Floor Drains: Floor drains in the maintenance building collect wastewater from vehicle

maintenance. This waste discharges to an on-site oil/water separator

Dry wells/Pits: None observed.

Machine Pits: None observed.

Service Pits: None observed.

Hydraulic Lifts: None observed.

Pump Islands: One dispensing pump associated with the 10,000-gallon UST was observed.

Loading Racks: None observed.

Lagoons:

None observed.

Transformers:

None observed.

#### FACILITIES PRESENT (ADJACENT TO SITE):

Pump Islands:

UPS which is located south of the site across Wayside Avenue is equipped with a

pump island.

Loading Racks:

None observed.

Lagoons:

None observed.

Transformers:

Pole mounted transformers were observed along Wayside Avenue.

#### VEGETATION (INDICATIONS OF STRESS, ABSENCE OF VEGETATION):

The site is almost entirely paved or covered by buildings. Very little vegetation was observed on-site. Vegetation present around the office building did not appear to be stressed. Vegetation on surrounding property also did not appear to be stressed.

#### WETLANDS:

No evidence of wetlands was noted during the site visit.

#### SURFACE SOIL (INDICATIONS OF STAINING, RELEASES):

Incidental oil staining was noted in the paved areas of the site. Surficial oil staining was noted on asphalt in the eastern part of the site.

#### ABUTTING PROPERTIES:

#### Use:

Abutting properties to the south include a residential house, commercial and industrial businesses and

Document:	Section.1	
Site Location	n and Settin	g

Project Number 13997 August 15, 2000 Page 28

Wayside Avenue. Town Way abuts the site to the east.

Use/Storage/Disposal of Oil/Hazardous Materials:

Commercial and industrial businesses on Doty Circle abut the site to the west.

# ATTACHMENT II

New England DataMap

## DataMap Technology Corporation

## Environmental FirstSearch™ Report

### TARGET PROPERTY:

### 115 WAYSIDE AVE

### WEST SPRINGFIELD MA 01089

Job Number: 13997

## PREPARED FOR:

Environmental Compliance Services, Inc. 588 Silver Street Agawam, Massachusetts 01001

07-26-00



Tel: (781) 320-3720

Fax: (781) 320-3715

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Target Site:

115 WAYSIDE AVE

WEST SPRINGFIELD MA 01089

#### FirstSearch Summary

Database	Sel	Updated	Radius	Site	1/8	1/4	1/2	1/2 >	ZIP	TOTALS
NPL	Y	01-19-00	1.00	0	0	0	0	0	0	0
CERCLIS	Y	04-16-00	1.00	0	0	Q	0	0	0	0
RCRA TSD	Y	06-24-00	0.50	1	0	0	0	25	0	1
RCRA COR	Y	06-24-00	1.00	1	0	0	0	0	0	1
RCRA GEN	Y	06-24-00	0.25	1	2	3		27	0	. 6
RCRA NLR	Y	10-18-99	0.25	1	1	3	-		0	5
ERNS	Y	01-06-00	0.25	0	0	0	-	1.7	0	0
NPDES	N	10-18-99	0.25	-	*		~	1.0	-	-
FINDS	N	09-21-99	0.25		-	+1				_
TRIS	N	07-16-98	0.25			*:	-			-
State Sites	Y	05-10-00	1.00	0	0	2	7	9	0	18
Spills-1990	Y	06-09-00	0.25	1	4	4	-		0	9
Spills-1980	Y	03-10-98	0.25	0	1	1	1.0	4	0	2
SWL	Y	12-07-99	0.50	0	0	0	0	-	0	0
Permits	N	NA	0.25			-		-	-	_
Other	N	NA	0.25	-	-			4	_	_
REG UST/AST	Y	03-29-00	0.25	2	1	2			1	6
Leaking UST	N	NA ·	0.50				ov sees		-	_
State Wells	N	12-02-99	0.50	**	*			7.4	4	_
Aquifers	N	01-20-99	0.50	**					-	20
ACEC	N	01-20-99	0.50	-	*				-	21
Wetlands	N	12-31-99	0.50			-	-		4	20
Floodplains	N	09-01-96	0.50	-	-		-			2
Receptors	Y	01-01-95	0.50	0	0	0	0	_	0	0
Nuclear Permits	N	04-30-99	0.50	-	-	-	4	_	2	2
Historic/Landmark	N	09-01-99	0.50	-		-	-	2	-	
Federal Land Use	N	06-17-98	0.50			-		23	12	2
Federal Wells	N	NA	0.50	-	-	-		2	-	2
Releases(Air/Water)	N	NA	0.25	27	-	•		¥.	-	
- TOTALS -				7	9	15	7	9	1	48

#### Notice of Disclaimer

Due to the limitations, constraints, inaccuracies and incompleteness of government information and computer mapping data currently available to DataMap Technology Corp., certain conventions have been utilized in preparing the locations of all federal, state and local agency sites residing in DataMap Technology Corp.'s databases. All EPA NPL and state landfill sites are depicted by a rectangle approximating their location and size. The boundaries of the rectangles represent the eastern and western most longitudes; the norther and southern most latitudes. As such, the mapped areas may exceed the actual areas and do not represent the actual boundaries of these properties. All other sites are depicted by a point representing their approximate address location and make no attempt to represent the actual areas of the associated property. Actual boundaries and locations of individual properties can be found in the files residing at the agency responsible for such information.

#### Waiver of Liability

Although DataMap Technology Corp. uses its best efforts to research the actual location of each site, DataMap Technology Corp. does not and can not warrant the accuracy of these sites with regard to exact location and size. All authorized users of DataMap Technology Corp.'s services proceeding are signifying an understanding of DataMap Technology Corp.'s searching and mapping conventions, and agree to waive any and all liability claims associated with search and map results showing incomplete and or inaccurate site locations.

## Environmental FirstSearch Site Information Report

Request Date:

07-26-00

Search Type: COORD

Requestor Name:

Karl M. Dietzler

Job Number: 13997

Standard: ASTM

FILTERED REPORT

Target Address:

115 WAYSIDE AVE

WEST SPRINGFIELD MA 01089

### Demographics

Sites:

48

Non-Geocoded: 1

Population: 1543

Radon:

0.8 - 8.1 PCL/L

#### Site Location

Degrees	(Decimal)

Degrees (Min/Sec)

**UTMs** 

Longitude:

-72.622865

-72:37:22

Easting:

696434.634

Latitude:

42,144225

42:8:39

Northing:

4668310.895

Zone:

18

#### Comment

Comment:

## Additional Requests/Services

### Adjacent ZIP Codes: 0.00 Mile(s)

#### Services:

ZIP				CAL ROLL COLOR	
Code	City Name	- 18	ST	Dist/Dir	Sel
			4		

D 60 B	Requested?	Date
Sanborns	N	
Aerial Photographs	N	
Topo Maps (hardcopy)	N	
City Directories	N	
Title Search	N	
Municipal Reports	N	
Online Topo Map	N	

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

13997

TOTAL:

48

GEOCODED: 47

NON GEOCODED:

1

SELECTED: 39

ID	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
I	RCRA	COMMERCIAL DISPOSAL CO INC MAD002791515/TSD	17 TOWN WAY WEST SPRINGFIE MA 01089	0.00 -	1
2	RCRACOR	COMMERCIAL DISPOSAL CO INC MAD002791515/TSD	17 TOWN WAY WEST SPRINGFIE MA 01089	0.00	1
3	RCRAGN	INTERNATIONAL BEAM WELDING CORP MAD981062961/VGN	63 DOTY CIR WEST SPRINGFIE MA 01089	0.15 NW	2
4	RCRAGN	NORTEK INC MAD043249432/SGN	70 DOTY CIR WEST SPRINGFIE MA 01089	0.14 NW	3
5	RCRAGN	NUMERIC MACHINING CO INC MAD108282377/SGN	195 WAYSIDE AVE WEST SPRINGFIE MA 01089	0.09 SW	4
6	RCRAGN	OIL RECOVERY CORP MAD079224341/SGN	17 TOWN WAY WEST SPRINGFIE MA 01089	0.00 —	I
7	RCRAGN	OMALLEY M J CO MAD982196354/VGN	54 WAYSIDE AVE WEST SPRINGFIE MA 01089	0.19 SW	5
8	RCRAGN	UNITED PARCEL SERVICE MAD985268663/VGN	120 WAYSIDE AVE WEST SPRINGFIE MA 01089	0.10 SW	7
9	RCRANLR	ARMSTRONG TOOL INC MAD066974429/NLR	122 DOTY CIR WEST SPRINGFIE MA 01089	0.23 NW	8
10	RCRANLR	COMMERCIAL DISPOSAL CO INC MAD002791515/NLR	17 TOWN WAY WEST SPRINGFIE MA 01089	0.00 -	.1
11	RCRANLR	MED WASTE MANAGEMENT INC MAD985278316/NLR	150 DOTY CIR WEST SPRINGFIE MA 01089	0.22 NW	10
12	RCRANLR	SANFORD TOOL & DESIGN INC MAD054431143/NLR	79 WAYSIDE AVE WEST SPRINGFIE MA 01089	0.14 SW	11
13	RCRANLR	SPACE AGE ASSOC INC MAD066995515/NLR	195 WAYSIDE AVE WEST SPRINGFIE MA 01089	0.09 SW	4
14	STATE	BERNARDÍNO S BAKERY 1-0000764/NFA	105 EXCHANGE ST. CHICOPEE MA 01013	0.57 NE	12
15	STATE	CABOTVILLE INDUSTRIAL PARK 1-0000468/NFA	165 FRONT ST. CHICOPEE MA 01013	0.71 NE	13
16	STATE	CHICOPEE GAS LIGHT COMPANY 1-0000610/DEF TIER 1B	DEPOT ST. CHICOPEE MA 01013	0.44 NE	14
17	STATE	DEPOT STREET PONDS 1-0000399/TIER 1A	200 DELTA PARK CHICOPEE MA 01013	0.37 NE	15
18	STATE	DICK \$ MOBIL #01-FG1 1-0000766/RAO	1130 RIVERDALE ST. WEST SPRINGFIE MA 01089	0.60 SW	16
19	STATE	DWIGHT CANAL 1-0000609/TIER 1A	DEPOT ST. CHICOPEE MA 01013	0.35 NE	17
20	STATE	EASTERN ETCHING 1-0000036/NFA	GRAPE ST. CHICOPEE MA 01013	0.99 NE	18

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

13997

TOTAL:

48

GEOCODED: 47

NON GEOCODED:

SELECTED:

D	DB Type	Şite Name/ID/Status	Address	Dist/Dir	Map ID
21	STATE	EXXON STATION 1-0000929/RAO	1247 RIVERDALE ST WEST SPRINGFIE MA 01089	0.41 SW	9
22	STATE	HAMPDEN POWER PLANT SITE 1-0000038/TIER IA	DEPOT ST. CHICOPEE MA 01013	0.29 NE	19
23	STATE	MOBIL STATION 01-QDW 1-0000373/UNCLASSIFIED	229 CENTER ST. CHICOPEE MA 01013	0.62 SE	20
24	STATE	PARCEL B 1-0000775/NDS	1100 RIVERDALE RD. WEST SPRINGFIE MA 01089	0.67 SW	21
25	STATE	PRIDE CITGO 1-0011709	1247 RIVERDALE STREET WEST SPRINGFIE MA 01089	0.41 SW	9
26	STATE	PROPERTY 1-0011074/TIER 2	128 ALTHEA ST WEST SPRINGFIE MA 01089	0.87 NW	22
27	STATE	PROPERTY 1-0000464/NFA	35 WAYSIDE AVE. WEST SPRINGFIE MA 01089	0.23 SW	23
28	STATE	REDS EXXON 1-0000898/RAO	1528 RIVERDALE ST WEST SPRINGFIE MA 01089	0.34 NW	6
29	STATE	REPUBLIC OIL 1-0000044/TIER 2	181 CENTER ST. CHICOPEE MA 01013	0.67 SE	24
30	STATE	SANFORD TOOL AND DESIGN . 1-0000710/NFA	79 WAYSIDE AVE. WEST SPRINGFIE MA 01089	0.14 SW	11
31	STATE	TRANSCOMM, INC. 1-0001060/RAO	63 CENTER STREET CHICOPEE MA 01013	0.82 NE	25
32	SPILLS	ED SYPEK CONSTRUCTION 1-0012655/72 HR	154 ASHLEY AVE WEST SPRINGFIE MA 01089	0.25 SE	26
33	SPILLS	MICHAEL S WHOLESALE BAIT W93-0264	WAYSIDE AVENUE WEST SPRINGFIE MA 01089	0.16 SW	27
34	SPILLS	MIKE S WHOLESALE BAIT W93-0274	74 WAYSIDE AVE WEST SPRINGFIE MA 01089	0.16 SW	27
35	SPILLS	OR DIESEL SPILL W92-0676	17 TOWN WAY WEST SPRINGFIE MA 01089	0.00	1
36	SPILLS	STORM DRAIN W91-0504	CORNER OF DOTY CIRCLE/WAYSIDE WEST SPRINGFIE MA 01089	0.14 SW	28
37	SPILLS	UNITED PARCEL SERVICE W91-0542	120 WAYSIDE AVENUE WEST SPRINGFIE MA 01089	0.10 SW	. 7
38	SPILLS	UNITED PARCEL SERVICES W90-0694	120 WAYSIDE AVENUE WEST SPRINGFIE MA 01089	0.10 SW	7
39	SPILLS	UPS W92-0472	120 WAYSIDE AVE WEST SPRINGFIE MA 01089	0.10 SW	7
40	SPILLS	UPS FACILITY W93-0427	120 WAYSIDE AVE WEST SPRINGFIE MA 01089	0.10 SW	7

TARGET SITE:

115 WAYSIDE AVE

WEST SPRINGFIELD MA 01089

JOB:

13997

TOTAL:

48

GEOCODED: 47

NON GEOCODED:

SELECTED:

ID	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
41	SPILLS80	W89-0269	120 WAYSIDE AVE WEST SPRINGFIE MA 01089	0.10 SW	7
42	SPILLS80	W89-0153	ASHLEY AVE & WAYSIDE AVE WEST SPRINGFIE MA 01089	0.13 SE	29
43	UST	BRINKS INC 0-007764	35 DOTY CIR WEST SPRINGFIE MA 01089	0.15 NW	30
44	UST	COMMERCIAL DISPOSAL CO. 0-007816	17 TOWN WAY WEST SPRINGFIE MA 01089	0.00 -	1
45	UST	COMMERCIAL DISPOSAL COMPANY INC 0-030081	17 TOWN WAY WEST SPRINGFIE MA 01089	0.00 —	1
46	UST	EDWARD S SYPEK 0-007765	154 ASHELY AVE WEST SPRINGFIE MA 01089	0.25 SE	26
47	UST	UNITED PARCEL SERVICE	120 WAYSIDE AVE WEST SPRINGER MA 01080	0.10 SW	7

TARGET SITE:

115 WAYSIDE AVE

WEST SPRINGFIELD MA 01089

JOB:

13997

TOTAL:

48

GEOCODED: 47

7 NO

NON GEOCODED:

SELECTED:

...

D DB Type

Site Name/ID/Status

Address

Dist/Dir

Map ID

UST

WAYSIDE AVENUE DIKE STATION 0-000978

OFF WAYSIDE AVE WEST SPRINGFIE MA 01089 NON GC

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

			RCRA TSD SITE										
SEARCH I	D: 1		D	IST/DIR:	0.00	-	·	MAP ID:	- 1				
ADDRESS:	17 TOWN WAY	DISPOSAL CO INC	T. 200	* * 1	REV: ID1: ID2: STATUS:		MAD002791	515					
CONTACT:	STONE	LARRY			PHONE:		4137371129						
ADDRES	S: 17 TOWN W	AY			NO	rified:	07/24/80						
ADDRES:	WEST SPRIN	AY NGFIELD MA 01089 TO CORRECTIVE AC	CTION		5777550	rified: XT A:	07/24/80		72				
	WEST SPRIN	NGFIELD MA 01089	CTION		5777550		07/24/80						
	WEST SPRIN	NGFIELD MA 01089	11-14-97 07-15-85	AGENCY: DOCKET:	5777550	UPDA		-14-97					
ACTIVITIES:	WEST SPRIN SUBJECT T	VIOL DATE: ACTION DATE:	11-14-97		PAF S, X	UPDA	ATED: 11		^				
ACTIVITIES: CM  E LIST: RAATS:	WEST SPRIN	VIOL DATE: ACTION DATE:	11-14-97		PAF S, X	UPDA	ATED: 11		6				
ACTIVITIES:  CM  E LIST: RAATS:  VIOL:	Y DCL, DOT, FE	VIOL DATE: ACTION DATE:	11-14-97		S, X 84-1056	UPDA	ATED: 11		*				

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

		RCRA COP	RSITE	RCRA COR SITE							
SEARCH	ID: 2	DIST/DIR:	0.00	MAP ID: 1							
Concrete		4		4 4							
NAME: COMMERCIAL DISPOSAL CO INC			REV:								
ADDRESS:	17 TOWN WAY WEST SPRINGFIELD MA 01089		ID1: ID2:	MAD002791515							
			STATUS:	TSD							
CONTACT:	STONE LARRY		PHONE:	4137371129							
VENT	DATE	STATUS									
CA075	03-30-94	ME									
CA225	04-14-95	IN									
CA050	04-14-95	RF									

TARGET SITE:

115 WAYSIDE AVE

WEST SPRINGFIELD MA 01089

JOB:

13997

RCRA GENERATOR SITE DIST/DIR: -0.15 NW MAP ID: 2 SEARCH ID: 3-INTERNATIONAL BEAM WELDING CORP 63 DOTY CIR NAME: ADDRESS: REV: ID1: MAD981062961 WEST SPRINGFIELD MA 01089 ID2: STATUS: PHONE: VGN 4137814368 VERONICA CONTACT: STROUCH ADDRESS: OWNERSTREET NOTIFIED: OWNERCITY MA 99999 PART A: ACTIVITIES: VG: GENERATES LESS THAN 100 KG/MONTH OF HAZARDOUS WASTE UPDATED: 11-10-98 CM+E LIST: VIOL DATE: AGENCY: DOCKET: UPDATED: 06-24-96 RAATS: ACTION DATE: VIOL: NUM: ENF: DATE: ASSESS: SETTLE:

		128	RCRA	GENERAT	OR SITE		
SEARCH I	D: 4		D	IST/DIR:	0.14 NW	MAP ID:	3
ADDRESS:	NORTEK INC 70 DOTY CIR WEST SPRING LABRECQUE	FIELD MA 01089 ROBERT	2.000		REV: ID1: ID2: STATUS: PHONE:	MAD043249432 SGN 4137814778	
		EET Y MA 99999 RATES 100-1000 KG	AAONTU OE	TIA ZA BENNIE	. PAR	TIFIED: 01/07/85 T A:	
ACTIVITIES		KATES 100-1000 KG	, MONTH OF	HAZARDOUS	WASIE	the second	2
CM+E LIST: RAATS:	Y	VIOL DATE: ACTION DATE:	05-22-92	AGENCY: DOCKET:	S	UPDATED: 11-10-98 UPDATED: 06-24-96	
VIOL: NUM: ENF:	GER 2 120 06-03-92	ASSESS:			SETTLE:		

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

		RCRA GENERA	TOR SITE	
SEARCH ID:		DIST/DIR:	-0.09 SW	MAP ID: 4
ADDRESS: 195 WA	RIC MACHINING CO INC LYSIDE AVE SPRINGFIELD MA 01089 VERN JOSEPH		REV: ID1: ID2: STATUS: PHONE:	MAD108282377 SGN 4137326544
	NERSTREET NERCITY MA 99999		NOTII PART	
ACTIVITIES: SG	: GENERATES 100-1000 KO	3/MONTH OF HAZARDOUS	WASTE	
CM+E LIST: RAATS:	VIOL DATE: ACTION DATE:	AGENCY: DOCKET:	To 1	UPDATED: 11-10-98 UPDATED: 06-24-96
VIOL: NUM: ENF: DATE:	ASSESS:		SETTLE:	

		RCRA GENERAT	OR SITE			
SEARCH ID:	6	DIST/DIR:	0.00		MAP ID:	1
ADDRESS: 17 TC	LECOVERY CORP DWN WAY I SPRINGFIELD MA 01089 NON JONATHAN-D		REV: ID1: ID2: STATUS: PHONE:	MAD079 SGN 4137371		
	CHARON TERRACE			FIED: 07/24	4/80	
	UTH HADLEY MA 01075		PART	ГА:		
ACTIVITIES: S	G: GENERATES 100-1000 KG/M	ONTH OF HAZARDOUS		r A:	v.	
		ONTH OF HAZARDOUS		ΓA:	197 <sub>6</sub>	
ACTIVITIES: S		ONTH OF HAZARDOUS  AGENCY: DOCKET:		UPDATED: UPDATED:		

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

	RCRA GENERA	TOR SITE			
SEARCH ID: 7	DIST/DIR:	0.19 SW		MAP ID:	5
NAME: OMALLEY M J CO ADDRESS: 54 WAYSIDE AVE WEST SPRINGFIELD MA 010 CONTACT: M J OMALLEY INC	089	REV: ID1: ID2: STATUS: PHONE:	MAD98 VGN 6175551	2196354	
ADDRESS: OWNERSTREET OWNERCITY MA 99999		NOT PAR	IFIED: Γ A:		
ACTIVITIES: VG: GENERATES LESS	THAN 100 KG/MONTH OF HAZ.	ARDOUS WASTE			×
CM+E LIST: VIOL DATE RAATS: ACTION DA	700 bar	•	UPDATED: UPDATED:	11-10-98 06-24-96	
VIOL: NUM: ENF: DATE: ASSESS:	SETTLE:				

		RCRA GENERAT	OR SITE				
SEARCH I	D: 8	DIST/DIR:	0.10 SW		MAP III	);	7
ADDRESS:	UNITED PARCEL SERVICE 120 WAYSIDE AVE WEST SPRINGFIELD MA 01089	25	REV: ID1: ID2: STATUS:	MAD98			
CONTACT:	UNITED PARCEL SERVICE	- 11/00	PHONE:	6175551	212		_
ADDRESS:	OWNERSTREET		NOTE	FIED:			
	OWNERCITY MA 99999		PART	A:			
ACTIVITIES		00 KG/MONTH OF HAZA		'A:			
ACTIVITIES		00 KG/MONTH OF HAZA				s :	
ACTIVITIES: CM+E LIST: RAATS:	: VG: GENERATES LESS THAN 1	RESERVED	RDOUS WASTE		11-10-98 06-24-96	s :	

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

-				CRA NLR			
SEARCH	ID: 9		D	IST/DIR:	0.23 NW		MAP ID: 8
NAME: ADDRESS:	122 DOTY C	G TOOL INC IR IGFIELD MA 01089	.33		REV: ID1: ID2: STATUS	MAD06	66974429
CONTACT:	WELCH	DAVID			PHONE:		1843
ADDRESS:	22 TO A CONT. PORT OF STREET	TREET ITY MA 99999			12:30	TIFIED: RT A:	
ACTIVITIES	S:						
				9			
CM+E LIST		VIOL DATE: ACTION DATE:	02-18-87	AGENCY: DOCKET:	S .	UPDATED:	11-10-98 06-24-96
RAAIS:							
RAATS: VIOL: NUM: ENF:	GER 1						

1000			ŀ	CRA NLR	SITE				100
SEARCH I	D: 10		D	IST/DIR:	0.00			MAP ID:	1
ADDRESS:	17 TOWN WAY WEST SPRING	FIELD MA 01089				REV: ID1: ID2: STATUS: PHONE:	MAD00 NLR 413737	2791515	
ADDRESS: 149 WAYSIDE AVENUE (PO BOX 30 WEST SPRINGFIELD MA 01089							IFIED: 07/2	24/80	***
ACTIVITIES	:				25				
* 1	원 및		1	**		83			+
	1.5	.2.	*				1		
CM+E LIST: RAATS:	Υ	VIOL DATE: ACTION DATE:	05-22-84 07-15-85	AGENCY: DOCKET:		S, X 84-1056	UPDATED: UPDATED:	11-10-98	
	DCL, DOT, FE	A, DFR							
VIOL: NUM:	22								

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

SEARCH ID: 11 S.  NAME: MED WASTE MA ADDRESS: 150 DOTY CIR		DIST/DIR:	0.22 NW		MAP ID:	10
					MAI ID.	10
WEST SPRINGFII			REV: ID1: ID2: STATUS:	MAD98	5278316	
CONTACT: NED WASTE MA	NAGEMENT INC		PHONE:	6175551	212	
ADDRESS: OWNERSTREE OWNERCITY I			NOTI	FIED: A:		
ACTIVITIES:					9	
SECOND PROPERTY.	VIOL DATE: ACTION DATE:	AGENCY: DOCKET:		UPDATED: UPDATED:	11-10-98 06-24-96	
VIOL: NUM: ENF:						
DATE:	ASSESS:	SETTLE:				

			RCRA NLR	SITE	+	
SEARCH ID: 12	/		DIST/DIR:	0.14 SW	MAP ID:	11
ADDRESS: 79 WAYS	D TOOL & DESIGN INC SIDE AVE PRINGFIELD MA 01089	19		REV: ID1: ID2: STATUS:	MAD054431143 NLR	
CONTACT: KURLAN	ID NORMAN			PHONE:	4137392583	
ADDRESS: OWNERSTREET OWNERCITY MA 99999				NOTIF PART		
ACTIVITIES:						
- 6-		to [5	5 e	*		
CM+E LIST: RAATS:	VIOL DATE: ACTION DATE:		AGENCY: DOCKET:		JPDATED: 11-10-98 JPDATED: 06-24-96	
VIOL: NUM: ENF:						
DATE:	ASSESS:		SETTLE:			

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

SEARCH ID: 13	4	DIST/DIR:	0.09 SW	MAP ID: 4
ADDRESS: 195 WAY	GE ASSOC INC ISIDE AVE PRINGFIELD MA 01089 GEORGE-W		REV: ID1: ID2: STATUS: PHONE:	MAD066995515 NLR 4137391937
1000	100			
	ERSTREET ERCITY MA 99999		NOTII PART	
ACTIVITIES:				
	VIOL DATE: ACTION DATE:	AGENCY: DOCKET:	100	UPDATED: 11-10-98 UPDATED: 06-24-96
ACTIVITIES:  CM+E LIST:	VIOL DATE:		100	

TARGET SITE:

115 WAYSIDE AVE

JOB:

		STATE SITE		
SEARCH ID: 16		DIST/DIR: 0.44 NE	MAP ID:	14
NAME: CHICOPEE GAS I DEPOT ST. CHICOPEE MA 0	JIGHT COMPANY	REV: ID1: ID2: STATUS: PHONE:	05/10/00 1-0000610 DEF TIER 1B	
LTBI: 4/15/89	CONFIRMED:	DELETED:	REMOVED:	
SITE INFORMATION:			*	
INITIATED: SAB ACTION BY: DEP ONLY		CURRENT STATUS: SITE STATUS:	P.A. L DEF TIER 1B	
ACTION TAKEN (REM CODE REQ TYPE: NON-PRIOR SITE DESCRIPTION:	):	REQ DUE:	8/2/96	
OTHER CONTAMINATION: OTHER RELEASES: OTHER PROBLEMS: OTHER TYPE OF SITE:	¥ 3			
SITE ACTIONS:				
	3 8			e e

TARGET SITE:

115 WAYSIDE AVE

WEST SPRINGFIELD MA 01089

JOB:

13997

STATE S	ITE
SEARCH ID: 17 DIST/DIR:	0.37 NE MAP ID: 15
NAME: DEPOT STREET PONDS ADDRESS: 200 DELTA PARK CHICOPEE MA 01013 CONTACT:	REV: 05/10/00 ID1: 1-0000399 ID2: STATUS: TIER 1A PHONE:
LTBI: 4/15/88 CONFIRMED: 7/15/88 DELE	TED: REMOVED:
SITE INFORMATION:	
	RRENT STATUS: PHASE 2 E STATUS: TIER 1A
ACTION TAKEN (REM CODE): REQ TYPE: RE	Q DUE:
SITE DESCRIPTION: AIR RELEASE; FORMER; GROUNDWATER RE RELEASE TO SOIL; SURFACE WATER RELEASE;	LEASE; INDUSTRIAL SITE; PETROLEUM PRESENT;

SITE ACTIONS:

TS DATE: 5/17/96 RA STATUS: APORAL

OTHER CONTAMINATION: OTHER RELEASES: OTHER PROBLEMS: OTHER TYPE OF SITE:

AUL DATE: LSP: RAS TYPE:

IRA

RAO CLASS:

AUL RESTRICTION:

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

SEARCH ID: 19 DIST/DIR: 0.35 NE MAP ID: 17  NAME: DWIGHT CANAL ADDRESS: DEPOT ST. CHICOPEE MA 01013 DID: 1-0000609 DID: STATUS: TIER 1A PHONE: TIER 1A TIER 1A PHONE: TIER 1A PHONE: TIER 1A PHONE: TIER 1A PHONE: TIER 1A TIER					STATE SI	TE			
NAME: DWIGHT CANAL DEPOT ST. CHICOPEE MA 01013  CONTACT: DEPOT ST. CHICOPEE MA 01013  CONTACT: DID: 1-0000609  DD: STATUS: STATUS: TIER 1A  PHONE:  LTBI: 4/15/89 CONFIRMED: 4/15/89 DELETED: REMOVED:  SITE INFORMATION:  INITIATED: SAB CURRENT STATUS: PHASE 1 C SITE STATUS: TIER 1A  ACTION TAKEN (REM CODE):  REQ TYPE: REQ DUE:  SITE DESCRIPTION:  OTHER CONTAMINATION: OTHER RELEASES: OTHER PROBLEMS: OTHER TYPE OF SITE:  SITE ACTIONS:  TS DATE: 8/10/99 RAS TYPE: PHASE I AUL RESTRICTION:  TS DATE: 3/10/98 RAS TYPE: DEP-1A RAS TYPE: DEP-1A RAS TATUS: RECPT RAO CLASS: AUL RESTRICTION:  LSP: DEP-1A RAS TATUS: CLASS: AUL RESTRICTION:	SEARCH ID	: 19 🚉				0.35 NE	MA	P ID:	17
SITE INFORMATION:  INITIATED: SAB	ADDRESS: D	EPOT ST.	013			ID1: ID2: STATUS:	1-0000609	100	
CURRENT STATUS: PHASE 1 C ACTION BY: RP ONLY  ACTION TAKEN (REM CODE): REQ TYPE:  OTHER CONTAMINATION: OTHER RELEASES: OTHER RYPE OF SITE:  SITE ACTIONS:  TS DATE: 8/10/99 RAS TYPE: PHASE 1 RAO CLASS: AUL DATE: LSP:  TS DATE: 3/10/98 RAS TYPE: DEP-1A RAS TATUS: RECPT AUL RESTRICTION:  RAS TYPE: DEP-1A RAO CLASS: AUL RESTRICTION:  LSP:	TBI: 4/1	5/89	CONFIRMED:	4/15/89	DELET	ED:	REMOVED:		
ACTION BY: RP ONLY  ACTION TAKEN (REM CODE): REQ TYPE: REQ DUE:  SITE DESCRIPTION:  OTHER CONTAMINATION: OTHER RELEASES: OTHER PROBLEMS: OTHER TYPE OF SITE:  SITE ACTIONS:  TS DATE: 8/10/99 RAS TYPE: PHASEI RAO CLASS: AUL DATE: LSP:  TS DATE: 3/10/98 RAS TYPE: DEP-1A RAS TYPE: DEP-1A RAS TATUS: RECPT RAO CLASS: AUL RESTRICTION:  LSP:	SITE INFORMA	ATION;							
REQ TYPE:  SITE DESCRIPTION:  OTHER CONTAMINATION: OTHER RELEASES: OTHER PROBLEMS: OTHER TYPE OF SITE:  SITE ACTIONS:  TS DATE: 8/10/99 RAS TYPE: PHASEI RA STATUS: CSRCVD RAO CLASS: AUL DATE: AUL RESTRICTION:  TS DATE: 3/10/98 RAS TYPE: DEP-1A RA STATUS: RECPT RAO CLASS: AUL DATE: AUL RESTRICTION:  LSP:		2773733			0.700000				
OTHER CONTAMINATION: OTHER RELEASES: OTHER PROBLEMS: OTHER TYPE OF SITE:  SITE ACTIONS:  TS DATE: 8/10/99 RAS TYPE: PHASEI RAS TATUS: CSRCVD RAO CLASS: AUL DATE: AUL RESTRICTION: LSP:  TS DATE: 3/10/98 RAS TYPE: DEP-1A RAS TATUS: RECPT RAO CLASS: AUL DATE: AUL RESTRICTION: LSP: AUL RESTRICTION: LSP: AUL RESTRICTION:		N (REM CODE)	i.		REQ	DUE:			
OTHER RELEASES: OTHER PROBLEMS: OTHER TYPE OF SITE:  SITE ACTIONS:  TS DATE: 8/10/99  RAS TYPE: PHASEI RAO CLASS: AUL DATE: AUL RESTRICTION:  LSP:  TS DATE: 3/10/98  RAS TYPE: DEP-1A RAS TYPE: DEP-1A RAS TATUS: RECPT RAO CLASS: AUL RESTRICTION:  LSP:	SITE DESCRIP	TION:							
TS DATE: 8/10/99  RAS TYPE: PHASEI  RAO CLASS: AUL DATE: LSP:  TS DATE: 3/10/98  RAS TYPE: DEP-1A  RAS TYPE: DEP-1A  RAS TYPE: AUL RESTRICTION:  LSP: AUL RESTRICTION:	OTHER RELEA	ASES: LEMS:	4	- 1	v +	25		12	
RA STATUS: CSRCVD  AUL DATE: LSP:  TS DATE: 3/10/98  RAS TYPE: DEP-1A  RA STATUS: RECPT  AUL DATE: AUL RESTRICTION:  LSP:	SITE ACTIONS	S:							
RA STATUS: RECPT RAO CLASS: AUL DATE: LSP:  RAO CLASS: AUL RESTRICTION:	RA STATUS: AUL DATE:				RAC	CLASS:	PHASEI		
	RA STATUS: AUL DATE:		u.		RAC	CLASS:	DEP-1A		
	-	N <sub>(R)</sub>			15.				

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

Company of the Assessment of the Company			S	TATE SITE	K		The second second
SEARCH ID	): 21 g		DIS	I/DIR: (	.41 SW	MAJ	P ID: 9
ADDRESS: 1	EXXON STATION 247 RIVERDALI WEST SPRINGFII	EST	etters.		REV: ID1: ID2: STATUS: PHONE:	05/10/00 1-0000929 RAO	
LTB1: 1/1	15/92	CONFIRMED:	7/15/93	DELETED		REMOVED:	
SITE INFORM INITIATED: ACTION BY:	ERB			CURRE SITE ST	NT STATUS: ATUS:	PHASE 2 RAO	
REQ TYPE:	EN (REM CODE			REQ DU			
	PTION: GAS S SOIL; WASTE O		INE PRESENT;	GROUNDWA	TER RELEASE;	CONTAINED IN A LU	ST;
OTHER CONT	AMINATION:						
OTHER CONT OTHER RELE OTHER PROB OTHER TYPE	ASES: BLEMS:	2		82 g	74 +	9 S	
OTHER RELE OTHER PROB	ASES: BLEMS: OF SITE:			R .	-	* s	
OTHER RELE OTHER PROB OTHER TYPE	ASES: BLEMS: OF SITE:			RAS TY RAO CI		RAO A-2 NON	

TARGET SITE:

115 WAYSIDE AVE

WEST SPRINGFIELD MA 01089

JOB:

ST	ATE SITE	
SEARCH ID: 22 DIST	/DIR: 0.29 NE	MAP ID: 19
NAME: HAMPDEN POWER PLANT SITE ADDRESS: DEPOT ST. CHICOPEE MA 01013  CONTACT:	REV: ID1: ID2: STATU PHONI	05/10/00 1-0000038 US: TIER 1A E:
LTBI: 4/15/87 CONFIRMED: 7/15/87	DELETED:	REMOVED:
SITE INFORMATION:		
INITIATED: SAB ACTION BY: RP ONLY	CURRENT STATUS SITE STATUS:	S: PHASE 2 TIER 1A
ACTION TAKEN (REM CODE): REQ TYPE:	REQ DUE:	
SITE DESCRIPTION: AIR RELEASE; FORMER; GROUNDW. RELEASE TO SOIL;	ATER RELEASE; LANDI	FILL; PETROLEUM PRESENT;
OTHER CONTAMINATION: OTHER RELEASES: OTHER PROBLEMS: OTHER TYPE OF SITE:		
SITE ACTIONS:		

TARGET SITE:

115 WAYSIDE AVE

JOB:

			STA	TE SITE			503-05
SEARCH ID:	25		DIST/DI	R: 0.41 SW	+ +	MAP ID:	- 9
ADDRESS: 124 WE	DE CITGO 7 RIVERDALI ST SPRINGFI	E STREET ELD MA 01089		REV: ID1: ID2: STATE	1-0011	00 709	
CONTACT:				PHON			
TBI:		CONFIRMED:	r	ELETED:	REMO	VED:	
SITE INFORMAT	TION:						
NITIATED: ACTION BY:				CURRENT STATUS	S:		
ACTION TAKEN REQ TYPE:	(REM CODE	;);		REQ DUE:			
SITE DESCRIPTI SITE ACTIONS:	ION:						
IS DATE: 3 RA STATUS: 1 AUL DATE: LSP:	3/9/98 TRANS	2 0 2		RAS TYPE: RAO CLASS: AUL RESTRICTIO	FEND N:		٠
2			¥3				
				00			
				(40)			

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

5500	STATE SITE	
SEARCH ID: 27	DIST/DIR: 0.23 SW MAP ID: 2	3
NAME: PROPERTY ADDRESS: 35 WAYSIDE AVE. WEST SPRINGFIELD MA 01089 CONTACT:	REV: 05/10/00 ID1: 1-0000464 ID2: STATUS: NFA PHONE:	
LTBI: 10/15/88 CONFIRMED:	DELETED: REMOVED:	
SITE INFORMATION:	•	
INITIATED: SAB ACTION BY:	CURRENT STATUS: P.A. L SITE STATUS: NFA	
ACTION TAKEN (REM CODE): REQ TYPE:	REQ DUE:	
SITE DESCRIPTION: SITE ACTIONS:		
TS DATE: 7/19/96 RA STATUS: AUL DATE: LSP:	RAS TYPE: DEP-NFA RAO CLASS: AUL RESTRICTION:	

TARGET SITE:

115 WAYSIDE AVE

WEST SPRINGFIELD MA 01089

JOB:

		STATE SI	TE	20.00000 PM 000000 000000	
SEARCH ID: 28	D	IST/DIR:	0.34 NW	MAP ID:	6
NAME: REDS EXXON ADDRESS: 1528 RIVERDALE ST WEST SPRINGFIELD MA 01089 CONTACT:		#24.7	REV: ID1: ID2: STATUS: PHONE:	05/10/00 1-0000898 RAO	
TBI: 7/15/91 CONFIRMED:	7/15/91	DELET	ED:	REMOVED:	
SITE INFORMATION: INITIATED: ERB ACTION BY: RP ONLY ACTION TAKEN (REM CODE):	8	SITE	RENT STATUS: STATUS:	PHASE 2 RAO	
REQ TYPE: SITE DESCRIPTION: GAS STATION; GROUN PETROLEUM PRESENT; RELEASE TO SOIL;	DWATER F		DUE: SOLINE PRESENT;	CONTAINED IN A LUST;	
OTHER CONTAMINATION: OTHER RELEASES: OTHER PROBLEMS: OTHER TYPE OF SITE:	75 61 ¥	( <u>a</u>		× 2	
SITE ACTIONS:					
TS DATE: 4/25/96 RA STATUS: AUL DATE: LSP:		RAC	TYPE: CLASS: RESTRICTION:	RAO A-2 NON	

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

- 1 - 20 - 1 - 20 - 1 - 20 - 1 - 20 - 1 - 20 - 1 - 20 - 1 - 20 - 20	STATE SITE		
EARCH ID: 30 DI	ST/DIR: 0.14 SW	MAP ID:	11
AME: SANFORD TOOL AND DESIGN 79 WAYSIDE AVE. WEST SPRINGFIELD MA 01089 ONTACT:	REV: ID1: ID2: STATU PHONE		
TBI: 1/15/90 CONFIRMED: 10/15/91	DELETED:	REMOVED:	
TE INFORMATION:			
NITIATED: UNSL CTION BY: RP ONLY	CURRENT STATUS SITE STATUS:	: PHASE 2 NFA	
CTION TAKEN (REM CODE): EQ TYPE:	REQ DUE:		
ITE DESCRIPTION: ITE ACTIONS:			
	*		

TARGET SITE: 115 WAYSIDE AVE

JOB:

	STATE SPIL	LS SITE			
SEARCH ID: 32	DIST/DIR:	0.25 SE	- Vyr	MAP ID:	26
AME: ED SYPEK CONSTRUCT ADDRESS: 154 ASHLEY AVE WEST SPRINGFIELD MA		REV: ID1: ID2: STATUS:	06/09/00 1-001265 72 HR	5	23
CONTACT:		PHONE:		-	
RELEASE NOTIFICATION DATE:	10/23/98				
RELEASE SOURCE:	UST				
TYPE OF CHEMICAL RELEASED: AMOUNT RELEASED:	GASOLINE 156 PPMV				
TYPE OF PROPERTY:	COMMERCIAL	5			
ACTION TAKEN: ACTION STATUS: TYPE OF RESPONSE ACT. OUTCOM	Immediate Response Action Oral Approval of Plan IE:	ACTION DATE:	10/23/1998		
ACTIVITY USE LIMITATION: LSP ID NUMBER:	6135				
N		12 8			9.77
ACTION TAKEN: ACTION STATUS:	Response Action Outcome RAO Statement Received	ACTION DATE:	12/22/1998		16
TYPE OF RESPONSE ACT. OUTCON REDUCED TO BACKROUND OR A TE ACTIVITY USE LIMITATION:	[	The Control of Control	ED: CONTAMI	NATION HAS B	EEN
	9908				

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

		STATE SPILI	S SITE		
SEARCH ID: 33		DIST/DIR:	0.16 SW	MAP ID:	27
NAME: MICHAEL S WHO ADDRESS: WAYSIDE AVEN WEST SPRINGFI HAMPDEN CONTACT: BOURCIER, J	UE	7/9	REV: ID1: ID2: STATUS: PHONE:	W93-0264 0000	
CASE CLOSED? SPILL DATE: DATE REPORTED: SPILL NOTIFIER:	YES 19930526 ANONYMOUS	REP	L TIME: ORT TIME: IFIER PHONE:	10:00PM	
SPILL DESCRIPTION: INCIDENT: MATERIAL SPILLED: AMT RPTD SPILLED:	OTHER RELEASE > P OTHER MATERIAL UNKNOWN	->	UAL AMT SPILLED	: UNKNOWN	
SOURCE OF SPILL: PET/HAZ: PCB LEVEL:	OTHER SOURCE > U HAZARDOUS UNKNOWN	NKNOWN	WASTE:		
ENVIRONMENTAL IMPACT:	20 N	028 N.	3	100	
LUST?: CONTRACTOR: DAYS/CLOSE:	NO NOT USED 0	NOT THE RES	CONTAMINATED? PARE REPORT:	de '	

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

	STATE	SPILLS SITE	
SEARCH ID: 34	DIST/	DIR: 0.16 SW	MAP ID: 2
NAME: MIKE S WHOLES ADDRESS: 74 WAYSIDE AV WEST SPRINGFI CONTACT: BOURCIER, J	E	REV: ID1: ID2: STATUS: PHONE:	W93-0274 0000
CASE CLOSED? SPILL DATE: DATE REPORTED: SPILL NOTIFIER:	YES 19930528 ANONYMOUS	SPILL TIME: REPORT TIME: NOTIFIER PHONE:	
SPILL DESCRIPTION: INCIDENT: MATERIAL SPILLED: AMT RPTD SPILLED: SOURCE OF SPILL: PET/HAZ: PCB LEVEL:	ACID (MISCELLANEOUS) UNKNOWN HAZARDOUS	ACTUAL AMT SPILLED: VIR/WASTE:	UNKNOWN
ENVIRONMENTAL IMPACT: LUST?: CONTRACTOR: DAYS/CLOSE:	NO NOT USED 0	SOIL CONTAMINATED?: PREPARE REPORT:	* *

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

	S	STATE SPILLS SITE	E	
SEARCH ID: 35	4.7	DIST/DIR: 0.00	MAP ID:	1
NAME: OR DIESEL SPILL 17 TOWN WAY WEST SPRINGFIE CONTACT: CARPENTER, C		REV: ID1: ID2: STATUS: PHONE:	W92-0676 0000	
CASE CLOSED? SPILL DATE: DATE REPORTED: SPILL NOTIFIER:	YES 19921201 19921201 DAN C, OIL RECOVER	SPILL TIME: REPORT TIME: NOTIFIER PHONE:	08:30AM 10:15AM	
SPILL DESCRIPTION:				
INCIDENT: MATERIAL SPILLED:	SPILL DIESEL FUEL			
AMT RPTD SPILLED: SOURCE OF SPILL:	11-50 GALLONS VEH. FUEL TANK	ACTUAL AMT SPILLED:	11-50 GALLONS	
PET/HAZ: PCB LEVEL:	PETROLEUM NONE	VIR/WASTE:	VIRGIN	
ENVIRONMENTAL IMPACT:	8	n 4 *		
LUST?: CONTRACTOR: DAYS/CLOSE:	NO NOT USED 3	SOIL CONTAMINATED?: PREPARE REPORT:	(¥	

TARGET SITE:

115 WAYSIDE AVE

WEST SPRINGFIELD MA 01089

JOB:

13997

STATE SPILLS SITE

SEARCH ID: 36 . . . DIST/DIR:

0.14 SW

MAP ID:

28

NAME: ADDRESS: STORM DRAIN

CORNER OF DOTY CIRCLE/WAYSIDE WEST SPRINGFIELD MA 01089 HAMPDEN

REV: ID1: ID2:

W91-0504

0000

STATUS: PHONE:

CONTACT: CARPENTER, C

YES

CASE CLOSED? SPILL DATE:

19910801

19910829

SPILL TIME: REPORT TIME:

04:15PM

DATE REPORTED: SPILL NOTIFIER:

BILL VERDONE-EPA

NOTIFIER PHONE:

SPILL DESCRIPTION:

INCIDENT:

DUMPING

MATERIAL SPILLED:

OTHER MATERIAL

AMT RPTD SPILLED: SOURCE OF SPILL:

UNKNOWN GALLONS

TANKER TRUCK

UNKNOWN

UNKNOWN GALLONS

PET/HAZ: PCB LEVEL:

NONE

VIR/WASTE:

WASTE

ENVIRONMENTAL IMPACT:

LUST?:

CONTRACTOR: DAYS/CLOSE:

NO

NOT USED

SOIL CONTAMINATED?: PREPARE REPORT:

ACTUAL AMT SPILLED:

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

	STA	TE SPILLS SITE	
SEARCH ID: 37	DIS	ST/DIR: 0.10 SW	MAP ID: 7
NAME: UNITED PARCEL: 120 WAYSIDE AV WEST SPRINGFIE HAMPDEN CONTACT: FISH, B	ENUE	REV: ID1: ID2: STATUS: PHONE:	W91-0542 0000
	70.		<i>t</i> .
CASE CLOSED? SPILL DATE: DATE REPORTED: SPILL NOTIFIER:	YES 19910923 19910923 JOHN FRESCHLIN- GTI	SPILL TIME: REPORT TIME: NOTIFIER PHONE:	11:10AM
SPILL DESCRIPTION:			
INCIDENT:	LEAK		
MATERIAL SPILLED: AMT RPTD SPILLED: SOURCE OF SPILL:	GASOLINE UNKNOWN GALLONS U.S.T.	ACTUAL AMT SPILLED:	UNKNOWN GALLONS
PET/HAZ: PCB LEVEL:	PETROLEUM NONE	VIR/WASTE:	VIRGIN
ENVIRONMENTAL IMPACT:	SOIL	pr.	e at 5
LUST?:	YES	SOIL CONTAMINATED?:	0
CONTRACTOR: DAYS/CLOSE:	NOT USED 347	PREPARE REPORT:	

TARGET SITE:

115 WAYSIDE AVE

JOB:

	ST	ATE SPILLS SITE		
SEARCH ID: 38	r	DIST/DIR: 0.10 SW	MAP ID:	7
AME: UNITED PARCEL 120 WAYSIDE AV WEST SPRINGFIE HAMPDEN CONTACT: CARPENTER, C	ENUE	REV: ID1: ID2: STATUS: PHONE:	W90-0694 0000	
CASE CLOSED?  PILL DATE:  DATE REPORTED:  PILL NOTIFIER:	YEŚ 19901030 19901030 BOB ROUKER - PLANT EI	SPILL TIME: REPORT TIME: NGINEER NOTIFIER PHONE:	11:00PM 10:35AM	
SPILL DESCRIPTION:			75	
NCIDENT: MATERIAL SPILLED: AMT RPTD SPILLED: SOURCE OF SPILL: PET/HAZ:	OVERFILL DIESEL FUEL 10-50 GALLONS VEH. FUEL TANK PETROLEUM	ACTUAL AMT SPILLEI VIR/WASTE:	):	
PCB LEVEL: ENVIRONMENTAL IMPACT:	NONE		er Pina <sup>*</sup>	
LUST?: CONTRACTOR: DAYS/CLOSE:	NO NOT USED 90	SOIL CONTAMINATED PREPARE REPORT:	?:	75
		9		

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

	STATE S	PILLS SITE	
SEARCH ID: 39	DIST/DI	IR: 0.10 SW	MAP ID: 7
NAME: UPS ADDRESS: 120 WAYSIDE AV WEST SPRINGFIE CONTACT: FISH, B		REV: ID1: ID2: STATUS: PHONE:	W92-0472 0000
CASE CLOSED? SPILL DATE: DATE REPORTED: SPILL NOTIFIER:	YES 19920826 GROUNDWATER TECHNOLOGY	SPILL TIME: REPORT TIME: NOTIFIER PHONE:	
SPILL DESCRIPTION:			*
INCIDENT: MATERIAL SPILLED: AMT RPTD SPILLED: SOURCE OF SPILL: PET/HAZ: PCB LEVEL:	OTHER RELEASE > DISCHARGE OTHER MATERIAL> UNKNOWN GALLONS OTHER SOURCE > FLOOR DRAIN BOTH UNKNOWN	ACTUAL AMT SPILLED: IS VIR/WASTE:	UNKNOWN GALLONS
ENVIRONMENTAL IMPACT:	SOIL	8 g 2 g	
LUST?: CONTRACTOR: DAYS/CLOSE:	NO NOT USED 0	SOIL CONTAMINATED?: PREPARE REPORT:	

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

	S'	TATE SPILLS SITE	100 to 10
SEARCH ID: 40		DIST/DIR: 0.10 SW	MAP ID: 7
NAME: UPS FACILITY ADDRESS: 120 WAYSIDE AV. WEST SPRINGFIE! HAMPDEN CONTACT: BOURCIER, J		REV: ID1: ID2: STATUS: PHONE:	W93-0427
CASE CLOSED? SPILL DATE: DATE REPORTED: SPILL NOTIFIER:	YES 19930806 19930806 RALPH DANFORTH/WES	SPILL TIME: REPORT TIME: ST SPRINGFIELD FD	01:00PM 01:15PM NOTIFIER PHONE:
SPILL DESCRIPTION:		GANESS Ex	
INCIDENT: MATERIAL SPILLED: AMT RPTD SPILLED: SOURCE OF SPILL: PET/HAZ:	TANK REMOVAL DIESEL FUEL UNKNOWN BELOW-GRND TANK PETROLEUM	ACTUAL AMT SPILLED: VIR/WASTE:	VIRGIN
PCB LEVEL:  ENVIRONMENTAL IMPACT:	SOIL		
LUST?: CONTRACTOR: DAYS/CLOSE:	NOT USED	SOIL CONTAMINATED?: PREPARE REPORT:	

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

	ST	ATE SPILLS	80's SITE		
SEARCH ID: 41		DIST/DIR:	0.10 SW	MAP ID:	7
NAME: ADDRESS: 120 WAYSIDE AV WEST SPRINGFIE HAMPDEN CONTACT: PILEGI, S			REV: ID1: ID2: STATUS: PHONE:	W89-0269 0000	
SPILL DATE: DATE REPORTED: SPILL NOTIFIER:	19890606 19890606 HELEN ROCKLIFFE	REP	L TIME: ORT TIME: TIFIER PHONE:	11:55AM	
INCIDENT: MATERIAL SPILLED: AMT RPTD SPILLED: SOURCE OF SPILL: PET/HAZ: PCB LEVEL;	LEAK DIESEL FUEL UNKNOWN U.S.T. PETROLEUM	12.000	TUAL AMT SPILLED: /WASTE:	UNKNOWNVIRGIN	-
ENVIRONMENTAL IMPACT: LUST?: CONTRACTOR: DAYS/CLOSE:	NOT USED		L CONTAMINATED?; PARE REPORT:		85
	•				Det .

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

		STATE SPILLS	80's SITE		
SEARCH ID: 42		DIST/DIR:	0.13 SE	MAP ID:	29
NAME: ADDRESS: ASHLEY AVE & WEST SPRINGFI HAMPDEN CONTACT: PILEGI, S			REV: ID1: ID2: STATUS: PHONE:	W89-0153 0000	
SPILL DATE: DATE REPORTED: SPILL NOTIFIER:	19890405 19890405 HENRY BUKEK	REP	L TIME: ORT TIME: IFIER PHONE:		Œ
INCIDENT: MATERIAL SPILLED: AMT RPTD SPILLED: SOURCE OF SPILL: PET/HAZ: PCB LEVEL:	SPILL DIESEL FUEL 10-50 GALLONS PIPE/HOSE/LINE PETROLEUM NONE		TUAL AMT SPILLED: WASTE:	VIRGIN	
ENVIRONMENTAL IMPACT	r,				
LUST?: CONTRACTOR: DAYS/CLOSE:	NO NOT USED I		CONTAMINATED?: PARE REPORT:		
			e		
					Ţ.

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

	REGISTERED	וממט	ERGROU	ND STORAGE	EIANKS		
SEARCH ID: 43		DIS	ST/DIR:	0.15 NW		MAP ID:	30
	BFIELD MA 01089			REV: ID1: ID2: STATUS:	03/29/00 0-007764		
CONTACT: BRINKS INC				PHONE:			-
TOTAL NUMBER OF TAN	KS: 1						
OWNER INFORMATION							
OWNER NAME:	BRINKS INC						
	35 DOTY CIR						
	WEST SPRINGFIELD MA	01089					
OWNER TELEPHONE:	(413) 733-6685						
OWNER TYPE:	Private			20			
O III DA TATA							
FACILITY INSURANCE IN	FORMATION		FACILITY	GROUNDWATER	INFORMATION	L	
COMMERCIAL INSURANCE	CE?:	NO	WITHIN D	RINKING SUPPLY	PROTECTION .	AREA?: NO	
SELF INSURED?:		NO	WITHIN A	WELLHEAD PR	OTECTION ARE.	A?: NO	
RISK RETENTION GROUP	RESPONSIBILITY?:	NO	WITHIN 10	OFEET OF A WE	TLAND?:	NO	
GUARANTEE FINANCIAL	RESPONSIBILITY?:	NO	WITHIN 30	OFEET OF A BO	DY OF WATER?:	NO	
TRUST FUND FINANCIAL		NO	TOWN FIR	E DEPARTMENT	CODE:	13325	
SURETY BOND FINANCIA		NO					
STATE FUND FINANCIAL		NO	+				
OTHER TYPES OF INSUR		Norma	1				
TANK NUMBER:	1						
TANK STATUS:	Removed		PIP	E STATUS:			
CONTENTS:	Diesel		7,777	ACITY:	4000 GALLON	IS	
DATE INSTALLED:	5/7/70 0:00:00			E LAST USED:	9/8/88 0:00:00		
DATE REMOVED:	2.1.70 0.00.00		2.1.	22.00.002	21010001100100		
HAS LEAK EVER BEEN D	ETECTED?:	NO					
IF DETECTED, WAS DEP	NOTIFIED OF LEAK?:	NO					
DEP TRACKING NUMBER							
TANK LEAK DETECTION	METHOD:						
PIPING LEAK DETECTIO	N METHOD:						
TANK MATERIAL/CONST	RUCTION:	Bare S	teel	75			
PIPE MATERIAL/CONSTI	RUCTION:	20		4			7.4
IS TANK LINED?:	54	NO	*	+ .	38		
DOES TANK HAVE EXCA	VATION LINER?:	NO	1.5		200	19	
INSTALL INSPTD BY ENG	INEER?:	NO					100
INSTALL INSPITO BY IMP	LEMENTING AGCY?:	NO					
DATE OF LAST TIGHTNE	CO TECT.						

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

REGISTER	RED UNDERGROUND STORAGE TANKS	4
SEARCH ID: 44	DIST/DIR: 0.00 MAP ID:	1
NAME: COMMERCIAL DISPOSAL CO. 17 TOWN WAY WEST SPRINGFIELD MA 01089 HAMPDEN	REV: 06/09/99 ID1: 0-007816 ID2: STATUS:	
CONTACT: NANCY FRATONI	PHONE: (413) 737-1129	_
TOTAL NUMBER OF TANKS: 5		
OWNER INFORMATION		
OWNER NAME: COMMERCIAL DISPO OWNER ADDRESS: 115 WAYSAID / 17 TO SPRINGFIELD MA 01	OWNWAY	
OWNER TELEPHONE: (413) 737-1129 OWNER TYPE: Private		
FACILITY INSURANCE INFORMATION	FACILITY GROUNDWATER INFORMATION	
COMMERCIAL INSURANCE?: SELF INSURED?:	NO WITHIN DRINKING SUPPLY PROTECTION AREA?: NO NO WITHIN A WELLHEAD PROTECTION AREA?: NO	
RISK RETENTION GROUP RESPONSIBILITY?		
GUARANTEE FINANCIAL RESPONSIBILITY?:	[1]	400
TRUST FUND FINANCIAL RESPONSIBILITY?:		5
SURETY BOND FINANCIAL RESPONSIBILITY STATE FUND FINANCIAL RESPONSIBILITY?:		
OTHER TYPES OF INSURANCE:	Normal	
TANK NUMBER: 1		
TANK STATUS: Removed	PIPE STATUS:	
CONTENTS: Diesel DATE INSTALLED: 5/1/73	CAPACITY: 10000 GALLONS	
DATE INSTALLED: 5/1/73 DATE REMOVED:	DATE LAST USED: 12/30/89 0:00:00	
HAS LEAK EVER BEEN DETECTED?:	NO	
IF DETECTED, WAS DEP NOTIFIED OF LEAK	?: NO	
DEP TRACKING NUMBER:		
TANK LEAK DETECTION METHOD: PIPING LEAK DETECTION METHOD:		
TANK MATERIAL/CONSTRUCTION:	Bare Steel	
PIPE MATERIAL/CONSTRUCTION:	NO .	
IS TANK LINED?: DOES TANK HAVE EXCAVATION LINER?:	NO NO	4
INSTALL INSPTD BY ENGINEER?:	NO	*
INSTALL INSPTD BY IMPLEMENTING AGCY DATE OF LAST TIGHTNESS TEST:		
TANK NUMBER: 2		
TANK STATUS: Removed	PIPE STATUS:	
CONTENTS: Gasoline	CAPACITY: 3000 GALLONS	
DATE INSTALLED: 5/1/65 DATE REMOVED:	DATE LAST USED: 12/30/89 0:00:00	
HAS LEAK EVER BEEN DETECTED?:	NO	
	- Continued on next page -	

TARGET SITE:

115 WAYSIDE AVE

WEST SPRINGFIELD MA 01089

JOB:

SEARCH ID: 44 DIST/DIR: 0.00 MAP ID: 1  NAME: COMMERCIAL DISPOSAL CO. 17 TOWN WAY			ROUND STORAGE	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7		177
ADDRESS: 17 TOWN WAY WEST SPRINGFIELD MA 01089 HAMPDEN CONTACT: NANCY FRATONI  IF DETECTED, WAS DEP NOTIFIED OF LEAK?: DEP TRACKING NUMBER: TANK LEAK DETECTION METHOD: PIPING LEAK DETECTION METHOD: PIPING LEAK DETECTION METHOD: STATUS: PHONE: (413) 737-1129  Bare Steel PIPE MATERIAL/CONSTRUCTION: Bare Steel PIPE MATERIAL/CONSTRUCTION: BY TANK LINED: NO DOES TANK HAVE EXCAVATION LINER?: NO DATE OF LAST TIGHTNESS TEST:  TANK NUMBER: 3 TANK STATUS: Removed CONTENTS: DATE REMOVED:  HAS LEAK EVER BEEN DETECTED?: IF DETECTED, WAS DEP NOTIFIED OF LEAK?: DEP TRACKING NUMBER: TANK LINED: NO DEP TRACKING NUMBER: TANK LINED: NO DEP TRACKING NUMBER: TANK LINED: NO DEP TRACKING NUMBER: NO DEP TRACKING NUMBER: TANK MATERIAL/CONSTRUCTION: BY TANK MATERIAL/CONSTRUCTION: BY TANK LINED: NO DEP TRACKING NUMBER: TANK LINED: NO DESTANK HAVE EXCAVATION LINER?: NO NISTALL INSTID BY BY INFLEMENTING AGCY?: NO NISTALL INSTID BY MIPLEMENTING AGCY?: NO DATE OF LAST TIGHTNESS TEST:  TANK NUMBER: TANK MATERIAL/CONSTRUCTION: BY TANK LINED: DATE REMOVED:  TANK MATERIAL/CONSTRUCTION: DATE REMOVED:  TANK MATERIAL/CONSTRUCTION DATE REMOVED:  TANK LINED: DATE REMOVED:  TANK LINED: DATE REMOVED:  TANK MATERIAL/CONSTRUCTION DATE REMOVED:  TANK MATERIAL/CONSTRUCTION DATE REMOVED:  TANK LINED: DATE REMOVED:  TANK LINED: DATE REMOVED:  TANK LINED: DATE REMOVED:  TANK LINED: DATE REMOVED:  TANK MATERIAL/CONSTRUCTION DATE REMOVED	SEARCH ID: 44	DIST/D	IR: 0.00	1	MAP ID:	1
IF DETECTED, WAS DEP NOTIFIED OF LEAK?:  DEP TRACKING NUMBER:  TANK LAKE DETECTION METHOD:  TANK MATERIAL/CONSTRUCTION:  IS TANK LINED?:  DATE NAK LINED?:  DATE ANK LINED?:  TANK LINED?:  DATE OF LAST TIGHTNESS TEST:   TANK STATUS:  Removed  CONTENTS:  DATE INSTALLED:  DATE EXCEN NUMBER:  TANK SLEAK EVER BEEN DETECTED?:  IP DETECTED, WAS DEP NOTIFIED OF LEAK?:  DATE MAY EXCAVATION LINER?:  NO  DO STANK STATUS:  REMOVED:  HAS LEAK EVER BEEN DETECTED?:  IP DETECTED, WAS DEP NOTIFIED OF LEAK?:  DATE INSTALLED:  TANK MATERIAL/CONSTRUCTION:  IS TANK LINED?:  DATE MAY EXCAVATION LINER?:  NO  DO STANK SAYE EXCAVATION LINER?:  NO  DO STANK SAYE EXCAVATION LINER?:  NO  DO STANK SAYE EXCAVATION LINER?:  NO  DATE OF LAST TIGHTNESS TEST:  TANK MATERIAL/CONSTRUCTION:  DATE NO  DATE REMOVED:  TANK MATERIAL/CONSTRUCTION:  DATE NO  DATE REMOVED:  DATE NO  DATE REMOVED:  DATE NO  DATE NO  DATE NO  DATE NO  DATE LAST USED:  DATE LAST USED	ADDRESS: 17 TOWN WAY WEST SPRINGFIELD MA 01089 HAMPDEN		ID1: ID2:	0-007816		
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TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

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PIPE MATERIAL/CONSTRUCTION: IS TANK LINED?: DOES TANK HAVE EXCAVATION LINER?: INSTALL INSPTD BY ENGINEER?: INSTALL INSPTD BY IMPLEMENTING AGCY?: DATE OF LAST TIGHTNESS TEST:	NO NO NO			
TANK NUMBER: 5 TANK STATUS: Removed CONTENTS: Waste Oil DATE INSTALLED: 5/1/73 DATE REMOVED:		PIPE STATUS: CAPACITY: DATE LAST USED:	1000 GALLONS 12/30/89 0:00:00	
HAS LEAK EVER BEEN DETECTED?: IF DETECTED, WAS DEP NOTIFIED OF LEAK?: DEP TRACKING NUMBER: TANK LEAK DETECTION METHOD: PIPING LEAK DETECTION METHOD:	NO NO	5	a <sup>1,2</sup> /	
TANK MATERIAL/CONSTRUCTION: PIPE MATERIAL/CONSTRUCTION: IS TANK LINED?: DOES TANK HAVE EXCAVATION LINER?: INSTALL INSPTD BY ENGINEER?: INSTALL INSPTD BY IMPLEMENTING AGCY?: DATE OF LAST TIGHTNESS TEST:	Bare Steel NO NO NO NO	¥E		
	19		3 ° 2 %	to a

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

13997

	REGISTERED	UNDERGR	OUND STORAC	GE TANKS		
SEARCH ID: 45		DIST/DII	R: 0.00	N	IAP ID:	; 1
ADDRESS: 17 TOWN V	CIAL DISPOSAL COMPANY I WAY INGFIELD MA 01089	INC	REV: ID1: ID2:	03/29/00 0-030081		
CONTACT: DONALD	AUCHE	200	STATUS PHONE		29	
IF DETECTED, WAS DE	P NOTIFIED OF LEAK?: ER:	NO				
TANK LEAK DETECTION PIPENG LEAK DETECT	ON METHOD:	Interstitial Mor Suction: Check	nitoring : Valve at Dispenser			
TANK MATERIAL/CON PIPE MATERIAL/CONS IS TANK LINED?:	TRUCTION:	Cathodically P	rotected Steel Double V rotected Steel Single W			
DOES TANK HAVE EXC INSTALL INSPTD BY E		NO				
[BROTHE 410 VIOLENCE TO BE TO STATE OF VIOLENCE AND VIOL	MPLEMENTING AGCY?:	NO				
TANK NUMBER:	3					
TANK STATUS:	In Use Other		PIPE STATUS:	1000 GALLONS		
CONTENTS: DATE INSTALLED: DATE REMOVED:	9/9/89 0:00:00		CAPACITY: DATE LAST USED:	1000 GALLONS		
HAS LEAK EVER BEEN	DETECTED?:	NO	護			
DEP TRACKING NUMB		NO	960 C/C (877)			
TANK LEAK DETECTI PIPING LEAK DETECT		Interstitial Mor Suction: Check	nitoring k Valve at Dispenser			
TANK MATERIAL/CON			rotected Steel Double V			
IS TANK LINED?:	TROCTO	NO	totected Steet Strigte H	alica		
DOES TANK HAVE EX		NO				
INSTALL INSPTD BY E	NGINEER?: MPLEMENTING AGCY?:	NO NO				
DATE OF LAST TIGHT	THE PARTY OF THE P	173,E)				
			3	, a		
100		t) a	45		12	
TANK NUMBER:	4		Carrier State Communication			
TANK STATUS:	Removed Diesel		PIPE STATUS: CAPACITY:	10000 GALLONS		
CONTENTS: DATE INSTALLED:	5/1/73 0:00:00		DATE LAST USED:			
DATE REMOVED:			- The Block Coulds			
HAS LEAK EVER BEEN IF DETECTED, WAS DI DEP TRACKING NUMB TANK LEAK DETECTI	EP NOTIFIED OF LEAK?: BER:	NO NO				
PIPING LEAK DETECT						
**************************************	NSTRUCTION:	Bare Steel				

- Continued on next page -

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

		The state of the s		
SEARCH ID: 45	DIST/D	IR: 0.00	MAP ID	1
NAME: COMMERCIAL DISPOSAL COMPANY ADDRESS: 17 TOWN WAY WEST SPRINGFIELD MA 01089	INC	REV: ID1: ID2: STATUS:	03/29/00 0-030081	
CONTACT: DONALD FAUCHE		PHONE:	(413) 737-1129	
PIPE MATERIAL/CONSTRUCTION:				
S TANK LINED?:	NO			
DOES TANK HAVE EXCAVATION LINER?:	NO			
NSTALL INSPTD BY ENGINEER?:	NO			
NSTALL INSPTD BY IMPLEMENTING AGCY?:	NO			
DATE OF LAST TIGHTNESS TEST:				
TANK NUMBER: 5		*		
TANK STATUS: Removed		PIPE STATUS:		
CONTENTS: Gasoline		CAPACITY:	3000 GALLONS	
DATE INSTALLED: 5/1/65 0:00:00		DATE LAST USED:	12/30/89 0:00:00	
DATE REMOVED:		DATE LAST OSED.	1220007 0.00.00	
HAS LEAK EVER BEEN DETECTED?:	NO			
IF DETECTED, WAS DEP NOTIFIED OF LEAK?:	NO	100	199	
DEP TRACKING NUMBER:			F	310
TANK LEAK DETECTION METHOD:	-			
PIPING LEAK DETECTION METHOD:	656	e <sup>7</sup>		
TANK MATERIAL/CONSTRUCTION: PIPE MATERIAL/CONSTRUCTION:	Bare Steel			
IS TANK LINED?:	NO			
DOES TANK HAVE EXCAVATION LINER?:	NO			
INSTALL INSPTD BY ENGINEER?:	NO			
INSTALL, INSPTD BY IMPLEMENTING AGCY?: DATE OF LAST TIGHTNESS TEST:	NO		67	
TANK MUMBER.				
TANK NUMBER: 6 TANK STATUS: Removed		PIPE STATUS:		
CONTENTS:		CAPACITY:	1000 GALLONS	
DATE INSTALLED: 5/1/73 0:00:00		DATE LAST USED:	12/30/89 0:00:00	
DATE REMOVED:	20	PULL DURAL CORN.		
**************************************				*
HAS LEAK EVER BEEN DETECTED?:	NO	100		
IF DETECTED, WAS DEP NOTIFIED OF LEAK?:	NO			
DEP TRACKING NUMBER:				
TANK LEAK DETECTION METHOD:				
PIPING LEAK DETECTION METHOD:				
TANK MATERIAL/CONSTRUCTION:	Bare Steel			
PIPE MATERIAL/CONSTRUCTION:				
IS TANK LINED?:	NO			
DOES TANK HAVE EXCAVATION LINER?:	NO			
INSTALL INSPTD BY ENGINEER?:	NO			
	3.00			
INSTALL INSPTD BY IMPLEMENTING AGCY?:	NO			

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

13997

	REGISTEREI	D UNDERGROUND STORAGE TANKS
SEARCH ID: 46		DIST/DIR: 0.25 SE MAP ID: 26
NAME: EDWARD S ADDRESS: 154 ASHEL WEST SPR	Y AVE INGFIELD MA 01089	REV: 03/29/00 ID1: 0-007765 ID2: STATUS: PHONE: (413) 788-0256
TOTAL NUMBER OF TA	ANKS: 2	
OWNER INFORMATION	v	
OWNER NAME:	EDWARD S SYPEK	
OWNER ADDRESS:	186 ASHLEY AVE	
	WEST SPRINGFIELD MA	A 01089
OWNER TELEPHONE:	(413) 788-0256	
OWNER TYPE:	Private	9
FACILITY INSURANCE		FACILITY GROUNDWATER INFORMATION
COMMERCIAL INSURA	INCE?:	NO WITHIN DRINKING SUPPLY PROTECTION AREA?: NO
SELF INSURED?:	VID DECENORISED WAS IN	NO WITHIN A WELLHEAD PROTECTION AREA?: NO
	UP RESPONSIBILITY?:	NO WITHIN 100 FEET OF A WETLAND?: NO
H. 2011. [1] 11 (1) 11 (1) 11 (1) 12 (1) 12 (1) 12 (1) 12 (1) 12 (1) 12 (1) 12 (1) 12 (1) 12 (1) 12 (1) 12 (1)	AL RESPONSIBILITY?:	NO WITHIN 300 FEET OF A BODY OF WATER?: NO
TRUST FUND FINANCIA		NO. TOWN FIRE DEPARTMENT CODE: 13325
	TAL RESPONSIBILITY?:	NO .
OTHER TYPES OF INSI		NO .
TANK NUMBER:	1	
TANK STATUS:	Removed	PIPE STATUS: Removed
CONTENTS:	Diesel	CAPACITY: 4000 GALLONS
DATE INSTALLED:	5/8/76 0:00:00	DATE LAST USED: 10/23/98 0:00:00
DATE REMOVED:	10/23/98 0:00:00	DATE LAST USED: 10/23/90 0.00.00
HAS LEAK EVER BEEN	DETECTED?:	NO
IF DETECTED, WAS DE	P NOTIFIED OF LEAK?:	NO
DEP TRACKING NUMB	ER:	
TANK LEAK DETECTION	THE WOLLD IN SOME THE STREET, THE	(00)
PIPING LEAK DETECT	ION METHOD:	
TANK MATERIAL/CON	STRUCTION:	Bare Steel
PIPE MATERIAL/CONS	TRUCTION:	Bare Steel
IS TANK LINED?:	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	NO .
DOES TANK HAVE EXC	CAVATION LINER?:	NO
INSTALL INSPTD BY E		NO .
INSTALL INSPTD BY II	MPLEMENTING AGCY?	NO
DATE OF LAST TIGHT	NESS TEST:	
TANK NUMBER:	2	
TANK STATUS:	Removed	DIDE CTATUS.
CONTENTS:	Gasoline	PIPE STATUS: Removed
DATE INSTALLED:	5/8/76 0:00:00	CAPACITY: 4000 GALLONS
DATE REMOVED:	10/23/98 0:00:00	DATE LAST USED: 10/23/98 0:00:00
DATE KENTUYED:	10/23/96 0:00:00	
HAS LEAK EVER BEEN	DETECTEDS.	NO
THE PERSONS	I MANAGE ADDIE	1114

- Continued on next page -

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

REGISTERED	UNDERGROU	ND STORAGE TA	ANKS
SEARCH ID: 46	DIST/DIR:	0.23 SE	MAP ID: 26
NAME: EDWARD S SYPEK ADDRESS: 154 ASHELY AVE WEST SPRINGFIELD MA 01089		REV: ID1: ID2: STATUS:	03/29/00 0-007765
CONTACT: MARY SYPEK		PHONE:	(413) 788-0256
F DETECTED, WAS DEP NOTIFIED OF LEAK?: DEP TRACKING NUMBER: FANK LEAK DETECTION METHOD: PIPING LEAK DETECTION METHOD:	NO ·		
TANK MATERIAL/CONSTRUCTION: PIPE MATERIAL/CONSTRUCTION: IS TANK LINED?: DOES TANK HAVE EXCAVATION LINER?: INSTALL INSPTD BY ENGINEER?:	Bare Steel Bare Steel NO NO NO	10	
INSTALL INSPTD BY IMPLEMENTING AGCY?: DATE OF LAST TIGHTNESS TEST:	NO		
ė.			
<i>□</i>	,	6	10
			9
	10 A	04 D	¥ - 1
			4

TARGET SITE:

115 WAYSIDE AVE

WEST SPRINGFIELD MA 01089

JOB:

13997

	REGISTEREL	UND	ERGROUND STORAG	E TANKS	
SEARCH ID: 47	a.	. DI	ST/DIR: 0.10 SW	MA.	P ID: 7
ADDRESS: 120 WAYS	ARCEL SERVICE IDE AVE INGFIELD MA 01089		REV: ID1: ID2:	03/29/00 0-007822	
CONTACT: ANDY TEN	CLITS		STATUS PHONE:		
TOTAL NUMBER OF T	ANKS: 6				
OWNER INFORMATIO					63
OWNER NAME:	SPRINGFIELD WET INC				
OWNER ADDRESS:	1700 W PARK DR PO BOX WESTBOROUGH MA 015				
OWNER TELEPHONE:	(508) 561-6131				
OWNER TYPE:	Private		14		
FACILITY INSURANCE	TNPODA (ATION		DI ON HEW CROUNDS I THE	n minony (Troy)	
COMMERCIAL INSUR		NO	FACILITY GROUNDWATE WITHIN DRINKING SUPPL	A CONTRACTOR OF THE PARTY OF TH	. NO
SELF INSURED?:	AICE::	YES	WITHIN A WELLHEAD PR	이번 시간 이 전에는 이 시간 원래를 하게 되었다.	NO
	OUP RESPONSIBILITY?:	NO	WITHIN 100 FEET OF A WI		NO
	AL RESPONSIBILITY?:	NO	WITHIN 300 FEET OF A BO		NO
	AL RESPONSIBILITY?:	NO	TOWN FIRE DEPARTMENT		13325
	CIAL RESPONSIBILITY?:	NO	TO MILLIAND DESCRIPTION	CODE	13323
	AL RESPONSIBILITY?:	NO	100		
OTHER TYPES OF INS		Norm	al		
TANK NUMBER:	3				
TANK STATUS:	Removed		PIPE STATUS:	Removed	
CONTENTS:	Diesel		CAPACITY:	8000 GALLONS	
DATE INSTALLED:	4/23/68 0:00:00		DATE LAST USED:	9/23/91 0:00:00	
DATE REMOVED:			4-		
HAS LEAK EVER BEEN		NO			
기계들은 이번에 있다. 이번 기계 이번에 가장하는 것 같아. 아름이는 가장이 있는 것 같아.	EP NOTIFIED OF LEAK?:	NO			
DEP TRACKING NUME					
THE REPORT OF A PARTY OF PERSONS ASSESSED.	CALAGORIAN				

TANK MATERIAL/CONSTRUCTION: Bare Steel PIPE MATERIAL/CONSTRUCTION: Bare Steel IS TANK LINED?: NO DOES TANK HAVE EXCAVATION LINER?: NO INSTALL INSPTD BY IMPLEMENTING AGCY?: NO

DATE OF LAST TIGHTNESS TEST:

TANK LEAK DETECTION METHOD: PIPING LEAK DETECTION METHOD:

TANK NUMBER:

TANK STATUS: Removed
CONTENTS: Gasoline
DATE INSTALLED: 4/23/68 0:00:00
DATE REMOVED: 9/23/91 0:00:00

PIPE STATUS: CAPACITY: DATE LAST USED: Removed 4000 GALLONS 9/23/91 0:00:00

HAS LEAK EVER BEEN DETECTED?:

NO

- Continued on next page -

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

EARCH ID: 47	DIST/DI	R: 0.10 SW	· · · · · · · · · · · · · · · · · · ·	IAP ID:	7
AME: UNITED PARCEL SERVICE 120 WAYSIDE AVE WEST SPRINGFIELD MA 01089	2	REV: ID1: ID2: STATUS:	03/29/00 0-007822	25	
ONTACT: ANDY TEKLITS		PHONE:	(508) 561-91	31	
F DETECTED, WAS DEP NOTIFIED OF LEAK?: EP TRACKING NUMBER: ANK LEAK DETECTION METHOD: IPING LEAK DETECTION METHOD:	NO			24	
ANK MATERIAL/CONSTRUCTION: IPE MATERIAL/CONSTRUCTION: S TANK LINED?: OOES TANK HAVE EXCAVATION LINER?: NSTALL INSPTD BY ENGINEER?: NSTALL INSPTD BY IMPLEMENTING AGCY?: DATE OF LAST TIGHTNESS TEST:	Bare Steel Bare Steel NO NO NO NO	28		20	
ANK NUMBER: 5 CANK STATUS: Removed CONTENTS: Gasoline OATE INSTALLED: 4/23/68 0:00:00 OATE REMOVED: 9/23/91 0:00:00	** (*)	PIPE STATUS: CAPACITY: DATE LAST USED:	Removed 4000 GALLONS 9/23/91 0:00:00	2	
HAS LEAK EVER BEEN DETECTED?: F DETECTED, WAS DEP NOTIFIED OF LEAK?: DEP TRACKING NUMBER: FANK LEAK DETECTION METHOD: PIPING LEAK DETECTION METHOD:	NO NO			¥	
TANK MATERIAL/CONSTRUCTION: PIPE MATERIAL/CONSTRUCTION: S TANK LINED?: DOES TANK HAVE EXCAVATION LINER?: INSTALL INSPID BY ENGINEER?: INSTALL INSPID BY IMPLEMENTING AGCY?: DATE OF LAST TIGHTNESS TEST:	Bare Steel Bare Steel NO NO NO NO				
	9	31, 1		. 85	
TANK NUMBER: 6 TANK STATUS: In Use CONTENTS: Gasoline DATE INSTALLED: 9/23/91 0:00:00 DATE REMOVED:		PIPE STATUS: CAPACITY: DATE LAST USED:	In Use 10000 GALLONS		176
HAS LEAK EVER BEEN DETECTED?: IF DETECTED, WAS DEP NOTIFIED OF LEAK?: DEP TRACKING NUMBER:	NO NO				
PANK LEAK DETECTION METHOD: PIPING LEAK DETECTION METHOD:	Interstitial Me Interstitial Sp		20		
	.9	3			

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

REGISTEREL	UNDERGROUND STORAGE TAN	KS .
SEARCH ID: 47 2.	DIST/DIR: 0.10 SW	MAP ID: 7
NAME: UNITED PARCEL SERVICE ADDRESS: 120 WAYSIDE AVE WEST SPRINGFIELD MA 01089	REV: ID1: ID2:	03/29/00 0-007822
CONTACT: ANDY TEKLITS	STATUS: PHONE:	(508) 561-9131
PIPE MATERIAL/CONSTRUCTION:	Fiberglass Reinforced Plastic Double Walled	
IS TANK LINED?:	NO	
DOES TANK HAVE EXCAVATION LINER?:	NO	
INSTALL INSPTD BY ENGINEER?:	NO	
INSTALL INSPTD BY IMPLEMENTING AGCY?: DATE OF LAST TIGHTNESS TEST:	NO	
TANK NUMBER: 7	400	
TANK STATUS: In Use	PIPE STATUS: In Us	0
CONTENTS: Gasoline		GALLONS
DATE INSTALLED: 9/23/91 0:00:00 DATE REMOVED:	DATE LAST USED:	
HAS LEAK EVER BEEN DETECTED?:	NO	
IF DETECTED, WAS DEP NOTIFIED OF LEAK?:	NO	
DEP TRACKING NUMBER:	U 0	
TANK LEAK DETECTION METHOD:	Interstitial Monitoring	34
PIPING LEAK DETECTION METHOD:	Interstitial Space Monitor	
TANK MATERIAL/CONSTRUCTION:	Fiberglass Reinforced Plastic Double Walled	
PIPE MATERIAL/CONSTRUCTION:	Fiberglass Reinforced Plastic Double Walled	
IS TANK LINED?:	NO	
DOES TANK HAVE EXCAVATION LINER?:	NO	
INSTALL INSPTD BY ENGINEER?:	NO	
INSTALL INSPTD BY IMPLEMENTING AGCY?: DATE OF LAST TIGHTNESS TEST:	NO	
TANK NUMBER: 8		×
TANK STATUS: In Use	PIPE STATUS: In Us	e
CONTENTS: Diesel		0 GALLONS
DATE INSTALLED: 9/23/91 0:00:00	DATE LAST USED:	
DATE REMOVED:		18
THE STATE OF THE S		10
HAS LEAK EVER BEEN DETECTED?:	NO	* 4
IF DETECTED, WAS DEP NOTIFIED OF LEAK?:	NO	
DEP TRACKING NUMBER:	CONTROL MANAGEMENT	
TANK LEAK DETECTION METHOD:	Interstitial Monitoring	
PIPING LEAK DETECTION METHOD:	Interstitial Space Monitor	
TANK MATERIAL/CONSTRUCTION:	Fiberglass Reinforced Plastic Double Walled	
PIPE MATERIAL/CONSTRUCTION:	Fiberglass Reinforced Plastic Double Walled	
IS TANK LINED?:	NO	
DOES TANK HAVE EXCAVATION LINER?:	NO	
INSTALL INSPTD BY ENGINEER?:	NO	
INSTALL INSPTD BY IMPLEMENTING AGCY?:	NO	
DATE OF LAST TIGHTNESS TEST:		

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

4	REGISTEREI	UND	ERGROU	IND ST	ORAG	E TA	NKS	and the second		
SEARCH ID: 48	ž. ,	DI	ST/DIR:	NON	1 GC	- 1	- 11	MAP	ID:	
ADDRESS: OFF WAYS	AVENUE DIKE STATION SIDE AVE INGFIELD MA 01089				REV: ID1: ID2:		03/29/00 0-000978			
CONTACT: RAYMONI	DBROUILLETTE				STATUS PHONE:		(413) 263-	3246		
TOTAL NUMBER OF T	ANKS: 1									
OWNER BIEGRALITO	N									
OWNER INFORMATIO			mire							
OWNER NAME:	TOWN OF WEST SPRING	FIELD I	DPW .							
OWNER ADDRESS:	26 CENTRAL ST	*****								
ON DEPT. DIES EDIT CO.	WEST SPRINGFIELD MA	01089								
OWNER TELEPHONE:	(413) 263-3240									
OWNER TYPE:	Local				80			87		
FACILITY INSURANCE	INFORMATION		FACILITY	GROUN	DWATE	RINFO	RMATION	-		
COMMERCIAL INSUR	ANCE?:	NO	WITHIN D	RINKIN	G SUPPL	Y PRO	<b>FECTION A</b>	REA?:	NO	
SELF INSURED?;		YES	WITHIN A	WELLI	HEAD PE	OTECT	TION AREA	?:	NO	
RISK RETENTION GRO	OUP RESPONSIBILITY?:	NO	WITHIN 1	00 FEET	OF A W	ETLAN	D?;		NO	
GUARANTEE FINANCI	AL RESPONSIBILITY?:	NO	WITHIN 3	00 FEET	OF A BC	DY OF	WATER?:		YES	
TRUST FUND FINANCI	AL RESPONSIBILITY?:	NO	TOWN FIL	RE DEPA	RTMEN	CODE	:		13325	4
SURETY BOND FINANCE	CIAL RESPONSIBILITY?:	NO					-			
STATE FUND FINANCI	AL RESPONSIBILITY?:	NO			1.0	70				
OTHER TYPES OF INS	URANCE:									
TANK NUMBER:	1									
TANK STATUS:	Removed			E STATI	15-11-11		noved			
CONTENTS:	Gasoline		1017.32	PACITY:			GALLONS			
DATE INSTALLED:	1/1/46 0:00:00		DA	TE LAST	USED:	11/1	7/98 0:00:00	8		
DATE REMOVED:	11/17/98 0:00:00									
HAS LEAK EVER BEEN	N DETECTED?:	NO								
IF DETECTED, WAS D	EP NOTIFIED OF LEAK?:	NO								
DEP TRACKING NUMB				+						
TANK LEAK DETECTI	ON METHOD:	Inven	tory Record-l	Ceeping						
PIPING LEAK DETECT	TION METHOD:		+							
TANK MATERIAL/COM			Steel Single V							
PIPE MATERIAL/CON:	STRUCTION:		Steel Single V	Valled			+	Vi)		
IS TANK LINED?:		NO		**		13	187			
DOES TANK HAVE EX		NO		1.	4	-		(5)	10.5	
INSTALL INSPTD BY E		NO				30				
INSTALL INSPTD BY I DATE OF LAST TIGHT	MPLEMENTING AGCY?: TNESS TEST:	NO								

#### Environmental FirstSearch Federal Databases and Sources

 NPL: National Priority List. The EPA's list of confirmed or proposed Superfund sites. of coni 

belated guarterily Updated quarterly.

2. CERCLIS: Comprehensive Environmental Response Compensation and Liability Information System. The EPA's database of current and potential Superfund sites currently or previously under investigation.

Updated quarterly.

3. RCRIS: Resource Conservation and Recovery Information System. The EPA's database of registered hazardous waste generators and treatment, storage and disposal facilities. Included are RAATS (RCRA Administrative Action Tracking System) and CMEL (Compliance Monitoring & Enforcement List).

Updated quarterly.

4. ERNS: Emergency Response Notification System. The EPA's database of EPA emergency response actions.

Updated quarterly.

5. NPDES: National Pollution Discharge Elimination System. The EPA's database of all permitted facilities receiving and discharging effluents to and from the environment.

Updated semi-annually.

6. FINDS: The Facility Index System. The EPA's Index of identification numbers associated with a property or facility which the EPA has investigated or has been made aware of in conjunction with various regulatory programs. Each record indicates the EPA office that may have files on the site or facility. 20.0

Updated quarterly.

#### Environmental FirstSearch Massachusetts Databases and Sources

 State Sites: Confirmed Disposal Sites and Locations To Be Investigated. The Department of Environmental Protection Agency database of confirmed, LTBI, waiver, deleted and reserved sites maintained by the Bureau of Waste Site Cleanup.

Updated immediately upon release.

 Spills: The Department of Environmental Protection Agency database of emergency response actions and spill releases maintained by the Bureau of Waste Site Cleanup.

Updated immediately upon release.

 Landfills: The Department of Environmental Protection Agency Agency database of active solid waste landfill facilities maintained by the Division of Solid Waste Management.

Updated annually.

 UST: Underground Storage Tanks. The Department of Public Safety/Office of the Fire Marshall's database of registered underground storage tanks.

Updated semi-annually.

 PWS: The Department of Environmental Protection Agency's database of public water supply well locations maintained by the Division of Water Supply and MassGIS.

Updated semi-annually.

 Aquifers: The Executive Office of Environmental Affairs GIS database of high, medium and low yield aquifers, EPA sole source aquifers, known zone II boundaries for public water supplies and surface water.

Updated annually.

7. ACEC: Areas of Critical Environmental Concern. The Executive Office of Environmental Affairs GIS database of legislated ACECs, protected open spaces, estimated habitats of endangered species and vernal pools.

Updated annually.

# Environmental FirstSearch Street Name Report for Streets within 1 Mile(s) of Target Property

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

Street Name	Dist/Dir	Street Name	Dist/Dir
Abbey St	0.52 SE	Home St	0.84 NE
Algonquin St	0.92 SE	Hooper Rd	0.98 NE
Althea St	0.73 NW	Howard St	0.71 NW
Amherst St	0.80 NW	I-391	0.42 NE
Annie s Way	0.95 NW	I-90	0.68 NW
Apple Ridge Rd	0.83 SW	I-91	0.58 SW
Arnold Ave	0.88 NW	Indian Park	0.93 SE
Ash St	0.70 NE	Joffre St	0.72 NE
Ashley Ave	0.13 SE	John Dr	0.98 NW
Bacon St	0.43 NW	Kennedy St	0.88 SE
Belvidere St	0.86 NW	Kimball St	0.45 SE
Beston St	0.61 SE	Labelle St	0.63 NW
Bill St	0.98 NE	Lemuel Ave	0.99 SE
Birch St	0.75 NW	Leonard St	0.43 NE
Blanchwood Ave	0.92 NW	Lina Ln	0.44 NW
Bradford Dr	0.92 SW	Lowell Pl	0.90 NE
Brightwater St	0.39 NW	Marion St	0.99 SE
Broadcast Ct	0.87 NE	Market Sq	0.79 NE
Brush Hill Ave	0.36 NW	Massasoit Ave	0.51 NW
Bullens St	0.54 NE	Mc Keag Ave	0.64 NE
Burton St	0.64 SE	Medina St	0.62 NW
Cabot St	0.73 NE	Miller St	0.79 NE
Canal St	0.95 NE	Mountain Ave	0.83 NW
Capital Dr	0.36 SW	Myron St	0.84 SW
Captain Mac St	0.88 SE	Niles St	0.54 NW
Casino Ave	0.88 SE	Nonotuck Ave	0.77 NE
Center St	0.57 SE	Normandeau St	0.42 NW
Chapin St	0.78 SE	Oglore St	0.82 NW
Chapman St	0.84 NE	Old Chicopee St	0.88 NE
Chester St	0.96 NE	Old Field Rd	0.78 NE
Chestnut St	0.57 NE	Orange St	0.58 NW
Chicopee St	0.88 NE	Paderewski St	0.75 NE
Clara St	0.69 NW	Pajak St	0.98 NE
Clayton Dr	0.82 SW	Park St	0.57 SE
Clinton St	0.87 NE	Parkwood Dr	0.86 NW
Clover Ave	0.86 NE	Parshley Ave	0.99 NE
Coleridge Pl	0.91 NE	Parshley St	0.99 NE
Conn River Brg	0.16 SE	Peace St	0.95 NW
Connecticut Ave	0.45 NW	Pearl St	0.91 NE
Coolidge Rd	0.96 NE	Perkins St	0.71 NE
Cooney Pl	0.61 NE	Plante Cir	0.73 SE
Craig Dr	0.85 SW	Pleasant St	0.88 NE
Daggett Dr	0.77 SE	Polaski Ave	0.84 NW
Dana Ave	0.84 NW	Pulaski St	0.69 NW
Delaney Ave	0.88 NE	Railroad Row	0.37 NE
Depot St	0.43 NE	Riverdale St	0.29 SW
Dix Ave	0.93 NE	Riverview Ave	0.79 NW
Doty Cir	0.13 SW	Sachem St	0.79 NW 0.94 SE
DOG CIL	0.13 5 14	Saction St	0.54 315

#### Environmental FirstSearch Street Name Report for Streets within 1 Mile(s) of Target Property

TARGET SITE:

115 WAYSIDE AVE WEST SPRINGFIELD MA 01089

JOB:

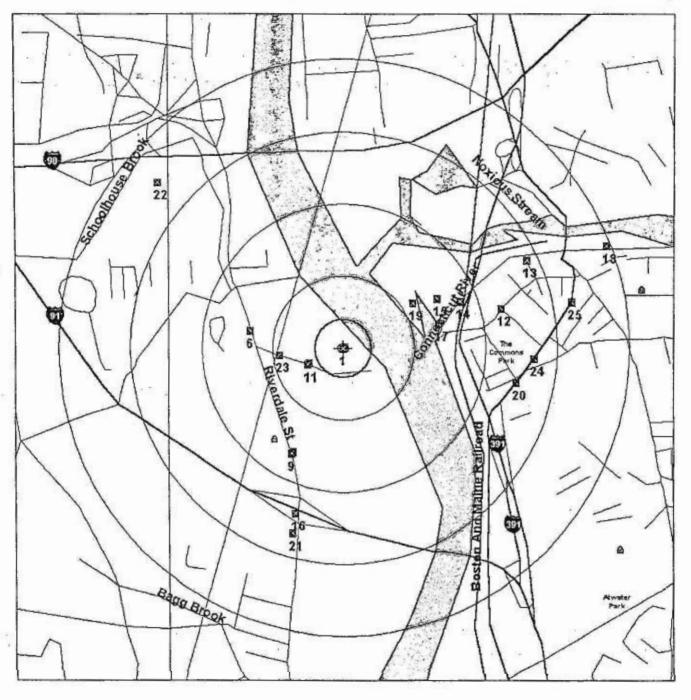


#### **Environmental FirstSearch**

1 Mile Radius ASTM Map: NPL, RCRACOR, STATE Sites



#### 115 WAYSIDE AVE, WEST SPRINGFIELD MA 01089



Black Rings Represent 1/4 Mile Radii; Red Ring Represents 500 ft. Radius

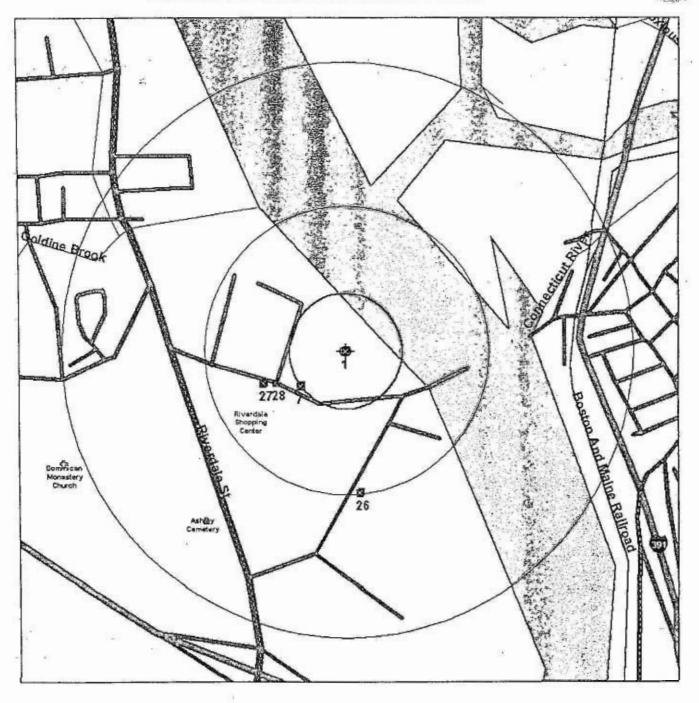


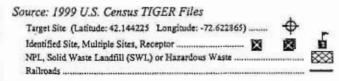
#### **Environmental FirstSearch**

.5 Mile Radius ASTM Map: CERCLIS, RCRATSD, SPILLS90, SWL



115 WAYSIDE AVE, WEST SPRINGFIELD MA 01089





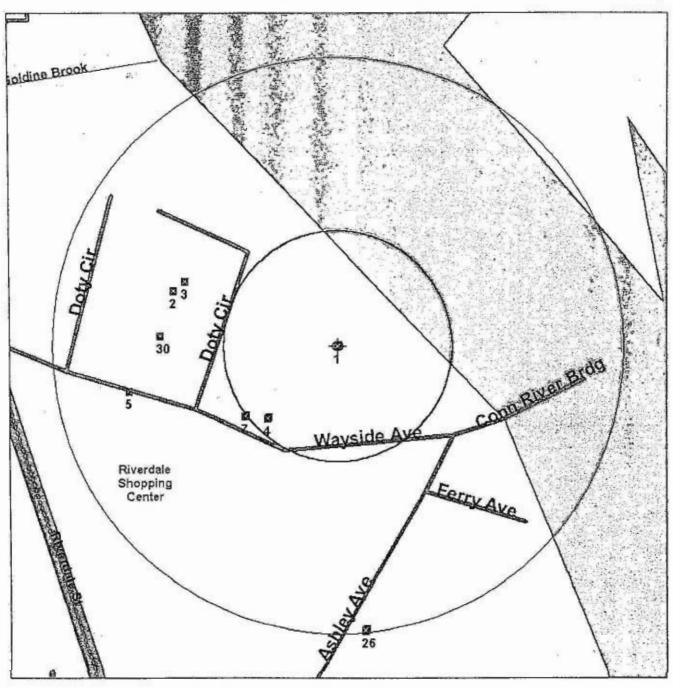


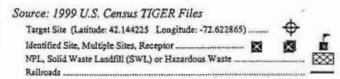
**Environmental FirstSearch** 

.25 Mile Radius ASTM Map: RCRAGEN, ERNS, UST



115 WAYSIDE AVE, WEST SPRINGFIELD MA 01089





Black Rings Represent 1/4 Mile Radii; Red Ring Represents 500 ft. Radius

# ATTACHMENT III ECS Protocols

### GENERAL SAMPLING PROCEDURES FOR AQUEOUS AND SOLID MATRICES

- During field sampling activities, the following applicable procedures will be practiced for sample collection:
- Whenever possible, samples will be collected first from the location expected to be least contaminated. Samples that are expected to be most contaminated will be collected last.
- Accurate and detailed field notes will be maintained in a bound field notebook. Soil samples will be examined and logged in the field.
- Sampling procedures will be performed with the overall intent of collecting representative samples and minimizing sample disturbance.
- Soil samples will be selected for analysis based on the results of qualitative field screening
  for total volatile organic vapors, visual and olfactory observations, and the depth of the
  water table.
- Sample containers will be labeled with the site name, project number and date prior to being filled with a sample.
- All sample collection, handling, and shipping information will be recorded in a field notebook.
- Groundwater samples will be logged, using the attached Groundwater Sampling Log.
   Samples of other matrices (sediment, surface water, soil, etc.) will be logged, using the attached Field Sampling Log.
- All samples should be collected according the specific requirements of the intended analytical method. Tables 1 and 2 provide lists of sample containers, preservation and holding time requirements for aqueous and soil/sediment samples, respectively.
- All samples will be placed in a chilled, thermally-insulated container containing ice. Blue
  ice, ice packs, or ice substitutes are not able to reach and maintain the required temperature
  until receipt at a laboratory.
- All soil samples for volatile organic compound analysis must be collected, preserved, and handled accordingly to SW846 Method 5035. The procedures are outlined in attached memorandum from Spectrum Analytical.
- All samples to be analyzed by Massachusetts Department of Environmental Protection methodologies for Volatile Petroleum Hydrocarbons (VPH) and Extractable Petroleum Hydrocarbons (EPH) will be collected according the published MADEP procedures outlined in the attached memorandum from Spectrum Analytical, Inc.

Environmental Compliance Services, Inc. 588 Silver Street, Agawam, Massachusetts 01001 MA: (413) 789-3530 FAX: (413) 789-2776

# WELL SAMPLING LOG

																Sheet 1 of 1
Clent									1	Job Number.	di Bo					
Location:	9		3							Date:						
Personnel:									1	Weather Conditions:	inditions:					
Well ID	0	Point of Reference	Total Depth	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Water Height (feet)	Volume Purged (gallons)	Odors (V/V)	PID Readings (ppmv)	Dissolved Oxygen (mg/L)	Æ	Sp. Cond.	Temp (°C)	Sample Time	Comments
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Stainless steel ballers	el ba	ilers				NA.			+	NA	Alcon	Alconox, methanol, DI	nol, DI			
Water Level Indicator	Indica	alor			4	Slope				NA	2	Methanol, DI	ĮQ.			
Temp-cond-pH meters	H H	eters				Corning					2	Methanol, DI	10			
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#### ENVIRONMENTAL

#### COMPLIANCE SERVICES Inc.

588 Silver Street Agawam, Massachusetts 01001

(413) 789 - 3530

Sheet \_ of \_ FIELD SAMPLING LOG

	DEPTH OF		ZUOZUOA (ZJEADUSOA P	()	REFERENCE	T	
NOTES / CASERYATION	SAUPLE (FT.)	рН	SPECIAL CONDUCT UTACY CTI	C / F	POHT (SURYEY STAKE) FLAG, ETC.)	MATRIX	SIMPLE LO.
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# SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

T	able 1	5. 4	
Containers, Pres	servation, S	Storage, &	& Holding Times
For Water	and Waste	water	
	Containers, Pre	3 [ 사이 () 프로토 () 이 () () () () () () () () () () () () ()	Table 1 Containers, Preservation, Storage, & For Water and Wastewater

Description	Method	Matrix	Sample Container <sup>1</sup>	Preservative <sup>2</sup>	Prep/Analysis Holding Time	Volume	
Volatile/Semivolatile Analyses			500				
Ethylene Dibromide (EDB)	504.1	H <sub>2</sub> O	G (b) Tef Sep	Cool 4° C 75µL Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Solution	14 days	40 ml <sup>3,4</sup>	
GC-Purgeable Halocarbons	601	H <sub>2</sub> O	G (b) Tef Sep	Cool 4° C HCl to pH<2 2	14 days	40 ml <sup>3,4</sup>	
GC-Purgeable Aromatics	602	H <sub>2</sub> O	G (b) Tef Sep	Cool 4° C HCl to pH<2 2,5	14 days 5	40 ml <sup>3,4</sup>	
GC-Pesticides & PCBs	608	H <sub>2</sub> O	AG (a) Tef Cap	Cool 4° C NaOH or H <sub>2</sub> SO <sub>4</sub> to pH 5-9 <sup>2</sup>	7/40 days <sup>6</sup>	IL 3,4	
HPLC or GC-PAHs	610	H <sub>2</sub> O	AG (a) Tef Cap	Cool 4° C 2	7/40 days <sup>6</sup>	1 L 3.4	
GC/MS Purgeables	624 524.2	H <sub>2</sub> O	G (b) Tef Cap	Cool 4° C HCl to pH<2 <sup>2,5</sup>	14 days <sup>5</sup>	40 ml <sup>3,4</sup>	
GC/MS Semivolatiles	625	H₂O	AG (a) Tef Cap	Cool 4º C	7/40 days <sup>6</sup>	1 L 23	
Petroleum Hydrocarbon Analyse	es						
Oil & Grease	413.1 413.2 1664	H <sub>2</sub> O	AG (a) Tef Cap	Cool 4°C H₂SO₄ to pH<2	28 days <sup>7</sup>	1L3	
Total Recoverable Petroleum Hydrocarbons by IR	418.1	H <sub>2</sub> O	AG (a) Tef Cap	Cool 4° C HCl to pH<2	28 days <sup>7</sup>	1 L 3	
Diesel Range Organics (DRO)	Modified 8015B	H <sub>2</sub> 0	G (b) Tef Cap	Cool 4°C HCl to pH <2	14/40 days 6	1 L 3	
Gasoline Range Organics (GRO)	Modified 8015B	H <sub>2</sub> O	G (b) Tef Sep	Cool 4º C HCl to pH <2	14 days	40 ml <sup>3,4</sup>	
Total Petroleum Hydrocarbons by GC	Modified 8100	H <sub>2</sub> O	G (a) Tef Cap	Cool 4° C HCl to pH <2	14/40 days <sup>6</sup>	1 L 3	
Total Petroleum Hydrocarbons by GC	Florida Pro	H <sub>2</sub> O	G (a) Tef Cap	Cool 4° C HCl to pH <2	14/40 days <sup>6</sup>	1 L 3	
MA DEP EPH	98-1	H <sub>2</sub> O	See Table 3				
MA DEP VPH	97-12	H <sub>2</sub> O		See Table	4	eş ar	
CT DPH ETPH	8015B	H <sub>2</sub> O	See Table 5				

#### ENVIRONMENTAL ANALYSES

Table 1	
Recommended Containers, Preservation, Storage, &	Holding Times
For Water and Wastewater	

Description	. Method,	Matrix	Sample Container <sup>1</sup>	Preservative <sup>2</sup>	Prep/Analysis Holding Time	Volume
Metal Analyses			- Continued		7.0,02.5	
AA Metals	200 Series	H <sub>2</sub> O	P or G (c)	Cool 4° C HNO <sub>3</sub> to pH<2 <sup>8</sup>	6 months	250 ml
ICP Metals	200.7	H <sub>2</sub> O	P or G (c)	Cool 4° C HNO <sub>3</sub> to pH<2 8	6 months	250 ml
Mercury	245.1	H <sub>2</sub> O	P or G (c)	Cool 4° C HNO <sub>3</sub> to pH<2 *	28 days 9	250 ml
Chromium VI	218.4	H <sub>2</sub> O	P or G	Cool 4° C	24 hours	200 ml
Lead, Organic	CA LUFT	H <sub>2</sub> O	G (a) Tef Cap	Cool 4° C	Analyze immediately	1 L 3
Inorganic/Wet Chemistry Analy	ses					
Ion Chromatography Anions	300.0	H <sub>2</sub> O	P or G	Cool 4° C	28 days 10	500 ml
Acidity	305,1	H <sub>2</sub> O	P or G	Cool 4° C	14 days	150 ml
Alkalinity	310.1	H <sub>2</sub> O	P or G	Cool 4° C	14 days	150 ml
BOD	405.1	H <sub>2</sub> O	P or G	Cool 4° C	48 hours	1 L
Bromide	320.1	H <sub>2</sub> O	PorG	Cool 4° C	28 days	100 ml
BTU	ASTMD 240	H₂O	P or G	Cool 4° C	28 days	50 ml
Carbon Dioxide	SM4500CO₂D	H <sub>2</sub> O	P or G	Cool 4º C	Analyze immediately	100 ml
Chloride	325.1	H <sub>2</sub> O	PorG	None Required	28 days	150 ml
Chlorine, Total Residual	330.1	H <sub>2</sub> O	P or G	None Required	Analyze immediately	200 ml
COD	410.4	H₂O	P or G	Cool 4° C H <sub>2</sub> SO <sub>4</sub> to pH<2	28 days	50 ml
Coliform, Fecal	SM 9220	H <sub>2</sub> O	Sterile Plastic	Cool 4° C2	6 hours	100 ml
Coliform, Fecal Strep	SM 9230	H <sub>2</sub> O	Sterile Plastic	Cool 40 C2	6 hours	100 ml
Coliform, Total	- SM 9222	H <sub>2</sub> O	Sterile Plastic	Cool 4° C2	30 hours	100 ml
Coliform, Standard Plate Count	SM 907C	H <sub>2</sub> O	Sterile Plastic	Cool 4° C2	24 hours	100 ml
Color	110.2	H <sub>2</sub> O	Sterile Plastic	Cool 4º C	48 hours	200 ml
Conductance, Specific	120.1	H <sub>2</sub> O	P or G	Cool 4° C	24 hours	100 ml
Cyanide, Amenable	335.1	H <sub>2</sub> O	P or G (a)	Cool 4° C NaOH to pH>12 2	14 days	500 ml
Cyanide, Physiologically Available	335.3	H <sub>2</sub> O	P or G (a)	Cool 4° C NaOH to pH>12 2	14 days	500 ml
Cyanide, Total	335.4	H <sub>2</sub> O	P or G (a)	Cool 4° C NaOH to pH>12 2	14 days	500 ml
Cyanide, Weak Acid Dissociable	SM4500 CN-I	H <sub>2</sub> O	P or G (a)	Cool 4° C NaOH to pH>12 2	14 days	500 ml
Flash Point	1010	H <sub>2</sub> O	PorG	Cool 4° C	ASAP	50 ml
Fluoride	340.2	H <sub>2</sub> O	PorG	None Required	28 days	200 m

144

Table 1	
Recommended Containers, Preservation, Storage, &	Holding Times
For Water and Wastewater	

Description w/2	Method	Matrix	Sample Container	Preservative <sup>2</sup>	Prep/Analysis Holding Time	Volume
Hardness	130.1 130.2	H <sub>2</sub> O	P or G	Cool 4° C HNO <sub>3</sub> to pH<2	6 months	100 ml
Iodide	345.1	H <sub>2</sub> O	P or G	Cool 4°C	24 hours	100 ml
MBAS (Surfactants)	425,1	H <sub>2</sub> O	P or G	Cool 4º C	48 hours	250 ml
Nitrogen, Ammonia	350.1 350.2	H <sub>2</sub> O	P or G	Cool 4° C H 2SO4 to pH<2	28 days	400 ml
Nitrogen, Total Kjeldahl	351.1 351.3	H <sub>2</sub> O	P or G	Cool 4° C H <sub>2</sub> SO <sub>4</sub> to pH<2	28 days	500 ml
Nitrogen, Nitrate	352.1	H <sub>2</sub> O	P or G	Cool 4° C	48 hours	250 ml
Nitrogen, Nitrate plus Nitrite	353.2 353.3	H <sub>2</sub> O	P or G	Cool 4° C H <sub>2</sub> SO <sub>4</sub> to pH<2	28 days	100 ml
Nitrogen, Nitrite	354.1	H <sub>2</sub> O	P or G	Cool 4 ° C	48 hours	100 ml
Odor	140.1	H <sub>2</sub> O	G	Cool 4°C	24 hours	500 ml
Orthophosphate	365.2	H <sub>2</sub> O	PorG	Filter immediately Cool 4° C	48 hours	100 ml
Oxygen, Dissolved	360.1 360.2	H <sub>2</sub> O	G Bottle and Top	None Required	Analyze immediately	300 ml
pH , Hydrogen ion	150.1 150.2	H <sub>2</sub> O	P or G	None Required	Analyze immediately	25 ml
Phenolics	420.1	H <sub>2</sub> O	G	Cool 4° C H <sub>2</sub> SO <sub>4</sub> to pH<2	28 days	1 L 3
Phosphorous, Total	. 365.2	H <sub>2</sub> O	P or G	Cool 4° C H <sub>2</sub> SO <sub>4</sub> to pH<2	28 days	500 ml
Phosphorous, Dissolved	365.2	H <sub>2</sub> O	P or G	Filter immediately Cool 4° C H <sub>2</sub> SO <sub>4</sub> to pH<2	24 hours	500 ml
Residue, Filterable (TDS)	160.1	H <sub>2</sub> O	P or G	Cool 4° C	7 days	300 ml
Residue, Non-filterable (TSS)	160.2	H <sub>2</sub> O	P or G	Cool 4° C	7 days	300 ml
Residue, Total	1,60.3	H <sub>2</sub> O	P or G	Cool 4º C	7 days	300 ml
Residue, Volatile	- 160,4	H <sub>2</sub> O	P or G	Cool 4° C	7 days	100 ml
Salimity	S210A	H <sub>2</sub> O	PorG	Cool 4° C	28 days	100 ml
Silica	200.7	H <sub>2</sub> O	P	Cool 4º C	28 days	200 ml
Settleable Solids	160.5	H <sub>2</sub> O	P or G	Cool 4º C	48 hours	1 L
Specific Gravity	ASTM D1298	H <sub>2</sub> O	P or G	Cool 4° C	28 days	500 ml
Sulfate	375.2	H <sub>2</sub> O	PorG	Cool 4° C	28 days	300 ml
Sulfide	376.1	H <sub>2</sub> O	P or G	Cool 4º C pH>9 11	7 days	500 ml
Sulfite	377.1	H <sub>2</sub> O	P or G	None Required	Analyze immediately	100 ml
Temperature	170.1	H₂O	P or G	None Required	Analyze immediately	1 L

# Table 1 Recommended Containers, Preservation, Storage, & Holding Times For Water and Wastewater

Description	Method	Matrix	Sample Container	Preservative <sup>2</sup>	Prep/Analysis Holding Time	Volume
Total Organic Carbon (TOC)	415.1	H <sub>2</sub> O	AG (a)	Cool 4° C H <sub>2</sub> SO <sub>4</sub> to pH<2	28 days	40 ml
Total Organic Halogens (TOX)	SW 9020B	H <sub>2</sub> O	AG	Cool 4° C	28 days	200 ml
Turbidity	180.1	H <sub>2</sub> O	P or G	Cool 4° C	48 hours	100 ml

#### Notes:

G(x) = glass; AG(x) = amber glass; P(x) = plastic; Tef Sep = Teflon septum; Tef Cap = Teflon lined cap; <math>x = cleaning protocol as follows: a = acid wash + solvent wash + oven dry; b = oven dry; c = acid wash.

For organics and bacteriological analysis, sodium thiosulfate is required for all chlorinated waters. For cyanide, use 0.6g ascorbic acid. Dechlorination must be performed prior to the addition of any necessary preservative.

Samples must be provided in duplicate to cover for breakage and provide sufficient sample for QC procedures.

Extractable organics with matrix spike/matrix spike duplicate QC protocols require a triplicate sample.

Fill completely to avoid volatile loss.

Samples with purgeable aromatics must be acidified with HCl to pH<2 in order to have a 14-day holding time.

Holding time is seven days from sample collection date for extraction, 40 days from extraction date for analysis of

the extract. Holding time is fourteen days for extraction if listed as 14/40.

The EPA has not recommended petroleum hydrocarbon holding times. The holding time given is the laboratory practice by analogy with Oil and Grease standards. State of New Jersey holding time is 7 days. California LUFT is 14 days.

For the determination of dissolved elements, the sample must be filtered through a 0.45 µm pore diameter membrane filter (prior to acidification) at the time of collection or as soon thereafter as practically possible and

acidified immediately thereafter.

The EPA allows only 14 days holding time for mercury in plastic bottles for drinking water analysis.

Certain anions require special handling. Holding times and preservation for a particular sample will be determined by the requirement for the anion of interest with the shortest holding time; e.g., nitrate and nitrite - 48 hours; orthophosphate-filter and 48 hours.

Zinc acetate and NaOH to pH>9.

Table 2	
Recommended Containers, Preservation, Storage, & Holding Ti	mes
For Soil, Solids, and Wastes	

Description	Method	Matrix	Sample Container	Preservative	Prep/Analysis Holding Time	Volume.
Volatile/Semivolatile Analyses					1 1	7
GC-Purgeable	8021B	Soil/Waste	G (b) Tef Sep	See Memo 9	14 days	See Memo 9
GC/MS- Purgeables	8260C	Soil/Waste	G (b) Tef Sep	See Memo 9	14 days	See Memo <sup>9</sup>
GC-Pesticides & PCBs	8081A/8082	Soil/Waste	AG (a) Tef Cap	Cool 4° C	14/40 days <sup>3</sup>	100 g or 8 oz Jar
GC/MS-Semivolatiles – PAHs Base Neutral/Acid Extractable	8270C	Soil/Waste	AG (a) Tef Cap	Cool 4° C	14/40 days <sup>3</sup>	100 g or 8 oz Jar
Petroleum Hydrocarbon Analy	yses				Prince Section 1	
Oil & Grease	Modified 413.2	Soil	G (a) Tef Cap	Cool 4° C	14/40 days 3,4	100 g or 8 oz Jar
Total Recoverable Petroleum Hydrocarbons	Modified 418.1	Soil	G (a) Tef Cap	Cool 4º C	14/40 days 3,4	100 g or . 8 oz Jar
Diesel Range Organics (DRO)	Modified 8015B	Soil	G (a) Tef Cap	Cool 4º C	14/40 days 3,4	100 g or 8 oz Jar
Gasoline Range Organics (GRO)	Modified 8015B	Soil	G (b) Tef Sep	Cool 4° C 15 ml CH <sub>3</sub> OH	14 days	15 g <sup>2</sup>
Total Hydrocarbons by GC	Modified 8100	Soil	G (a) Tef Cap	Cool 4° C	14/40 days 3,4	100 g or 8 oz Jar
Total Hydrocarbons by GC	Florida Pro	Soil	G (a) Tef Cap	Cool 4° C	14/40 days <sup>3,4</sup>	100 g or 8 oz Jar
MA DEP EPH	98-1	Soil	See Table 3			100000
MA DEP VPH	97-12	Soil	520 - 540 - 540	See Tabl	e 4	
CT DPH ETPH	8015B	Soil		See Tabl	e 5	
Metal Analyses	Vi Same and the					
Metals-AA	7000 Series	Soil	P or G (c)	Cool 4º C	6 months	100 g or 8 oz Jar
ICP Metals	6010B	Soil	P or G (c)	Cool 4º C	6 months	100 g or 8 oz Jar
Mercury	7471A	Soil	P or G (c)	Cool 4º C	28 days	100 g or 8 oz Jar
Lead, Organic	CA LUFT	Soil	G (a) Tef Cap	Cool 4° C	Analyze immediately	200 g or 8 oz Jar
General Inorganic Analyses					-	
General Inorganics	9000 Series	Soil	P or G (c) 5	Cool 4° C	Not to exceed Table 1 specifications	100 g or 8 oz Jar
Asbestos (Bulk)	EPA Interim Method	Bulk	G (a) Tef Cap	None	Indefinite	50 g minimum

# Table 2 Recommended Containers, Preservation, Storage, & Holding Times For Soil, Solids, and Wastes

Description	Method	Matrix	Sample Container <sup>t</sup>	Preservative	Prep/Analysis Holding Time	Volume
вти	ASTMD 240 SM 403	Soil	P or G	Cool 4° C	28 days	50 g
Flashpoint/Ignitability	1010	Soil	G (b) Tef Sep or G (a) Tef Cap	Cool 4º C	ASAP	100 g or 8 oz Jar <sup>6</sup>
pH/Corrosivity	9040B 9045C	Soil/Waste	P or G	Cool 4°C	ASAP 7	100 g or 2 oz Jar <sup>2</sup>
Reactivity	SW 846 Section 7.3	Soil/Waste	P or G	Cool 4°C	ASAP 7	100 g or 8 oz Jar
Standard Plate Count	907C	Soil/Solid/ Waste	Sterile Plastic	Cool 4° C	24 hours	100 g
TCLP/SPLP	1311/1312	Soil/Waste	Inorganics - P or G (c) or (a) Organics - G (a)	Cool 40 C if appropriate	varies by method	500 g or 32oz Jar <sup>2,8</sup>
Total Organic Carbon (TOC)	9060	Soil	G (a) Tef Cap	Cool 4º C	28 days	100g or 8 oz Jar
Total Organic Halogens (TOX)	9020B	Soil	G (a) Tef Cap	Cool 4º C	14 days	100g or 8 oz Jar

#### Notes:

- G(x) = glass; AG(x) = amber glass; P(x) = plastic; Tef Sep = Teflon septum; Tef Cap = Teflon lined cap; <math>x = cleaning protocol as follows: a = acid wash + solvent wash + oven dry; b = oven dry; c = acid wash.
- Fill completely to avoid volatile loss; if pre-weighted VOA vials are used, sample cannot exceed half volume of the vial.
- Holding time is fourteen days from sample collection date for extraction, 40 days from extraction date for analysis of extract.
- EPA has not recommended oil and grease, petroleum hydrocarbons or EDB holding times in soil. The holding time is given by analogy to extractable organics.
- Acid washed containers are not appropriate for nitrate and other N analysis. Use glass container ordered with cleaning protocol (1-Chem V220-0250, or equivalent).
- Fill completely to avoid volatile loss. If vials are used, a minimum of 4 is required.
- Holding time is not to exceed 14 days. If sulfide reactivity is sought, then not to exceed 7 days.
- TCLP samples with liquid require more sample volume. For example, a sample with 10% solids requires a minimum of 2000g. Aqueous samples should routinely be provided as 3 liters in order to cover for breakage and provide enough sample for laboratory QC.
- Refer to Spectrum Analytical Memorandum (M-020) dated March 12, 1999.

# Table 3 Recommended Containers, Preservation, Storage, & Holding Times For MA DEP EPH Samples

Matrix	Container	Preservative	Holding Time
Aqueous	1 liter amber glass bottle with Teflon-lined screw cap	Add 5 ml of 1:1 HCl; Cool to 4° C	Samples must be extracted within 14 days and analyzed within 40 days
Soil/Sediment	4-oz (120 ml) wide mouth amber glass jar with Teflon- lined screw cap	Cool to 4° C	Samples must be extracted within 7 days and analyzed within 40 days

Table 4
Recommended Containers, Preservation, Storage, & Holding Times
For MA DEP VPH Samples

Matrix	Container	Preservative	Holding Time
Aqueous	2 - 40 ml VOA vials with Teflon-lined screw caps	Add 3 to 4 drops of 1:1 HCl; Cool to 4° C	14 days
Soil/Sediment	2 - 40 ml VOA vials with Teflon-lined screw caps	Add 15 g of soil to pre-weighed, laboratory preserved VOA vials on site; additional sample without preservative is needed to figure dry weight calculation; Cool to 4° C	28 days

# Table 5 Recommended Containers, Preservation, Storage, & Holding Times For CT DPH ETPH Samples

Matrix	Container	Preservative	Holding Time
Concentrated Waste Sample	125 ml wide mouth glass container with Teston lined lid	None .	Samples must be extracted within 14 days and analyzed within 40 days
Water Samples with No Residual Chlorine Present	1 L amber glass containers with Teflon lined lids	Add 3 to 4 drops of 1:1 HCl; Cool to 4° C	Samples must be extracted within 7 days and analyzed within 40 days
Water Samples with Residual Chlorine Present	1 L amber glass containers with Teflon lined lids	Add 3 ml 10% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution per gallon. Add 3 to 4 drops of 1:1 HCl; Cool to 4° C*	Samples must be extracted within 7 days and analyzed within 40 days
Soil/Sediment and Sludge	250mL wide mouth glass container with Teflon lined lid	Cool to 4° C	Samples must be extracted within 14 days and analyzed within 40 days

<sup>\*</sup> Dechlorination must be performed prior to the addition of any necessary preservative.



#### Memorandum

(M-137)

To:

All Spectrum Analytical Clientele

From:

Sample Department

Date:

January 28, 1998

Subject:

Connecticut DEP TPH/GC Method

The following details sample collection, preservation, and handling guidelines for the Connecticut DEP Method, The Analysis of Total Petroleum Hydrocarbons Using Methylene Chloride Extraction and Gas Chromatograph/Flame Ionization Detection as prepared by the Environmental Research Institute of the University of Connecticut, September, 1997.

Recommended Containers, Preservation, Storage, & Holding Times For CT DEP TPH Samples								
Matrix	Container	Preservative	Holding Time					
Concentrated Waste Sample	125mL wide-mouth glass container with Teflon lined lid	None	Samples must be extracted within 14 days and analyzed within 40 days					
Water Samples with No Residual Chlorine Present	1 gal or 4 - 1 L amber glass containers with Teflon-lined lids	Cool to 4° C	Samples must be extracted within 7 days and analyzed within 40 days					
Water Samples with Residual Chlorine Present	1 gal or 4 - 1 L amber glass containers with Teflon-lined lids	Add 3 ml 10% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution per gallon. Cool to 4°C	Samples must be extracted within 7 days and analyzed within 40 days					
Soil/Sediment and Sludge	250mL wide mouth glass container with Teflon-lined lid	Cool to 4° C	Samples must be extracted within 14 days and analyzed within 40 days					

#### ENVIRONMENTAL ANALYSES



#### Important! Please copy and distribute to all Project Managers and Samplers!

To:

All Spectrum Analytical Clientele

From:

Sample Department

Date:

March 12, 1999

Subject:

New Sample Collection Techniques for VOC Soils

The following details Spectrum Analytical's policy regarding the collection, preservation, and handling of soil samples submitted for Volatile Organic Compounds (VOCs). These guidelines are in accordance with SW846 Method 5035 for Volatile Organics in Soil and Waste Samples. The Massachusetts Department of Environmental Protection beginning March 15, 1999 will strictly enforce these guidelines. Data for soil samples not properly preserved in accordance with specified guidelines will be rejected by the MA DEP.

The accurate sample collection technique depends on the expected concentration of VOCs in the sample. Techniques are group by three categories of sample types: low VOC concentration, high VOC concentration and oily waste samples.

#### Low concentration soil samples (< 200 µg/Kg or < .2 mg/Kg)

- 1. All samples must be collected in a manner that minimizes sample handling and agitation.
- Samples must be collected in 20ml VOA vials containing 5ml of sodium bisulfate solution provided by Spectrum Analytical.
- During collection approximately 5 grams of soil must be added to the pre-measured, preweighed sodium bisulfate vial. All sediment must be removed from the glass threads of the vial to ensure an adequate seal.
- Store samples on ice at 4°C until transport to the laboratory facility.
- Samples should always be collected in duplicate to cover for breakage and or laboratory quality control reanalysis.
- In addition, a third VOA vial (40ml) must be collected for screening, dry weight
  determination and high concentration analysis (if necessary). This third vial must not contain
  any sample preservation solution.

#### High concentration soil samples (> 200 µg/Kg or > .2 mg/Kg)

- 1. All samples must be collected in a manner that minimizes sample handling and agitation.
- Samples must be collected in 40ml VOA vials containing 15ml of purge and trap grade methanol provided by Spectrum Analytical.
- During collection approximately 10-15 grams of soil must be added to the pre-measured, preweighed methanol vial. All sediment must be removed from the glass threads of the vial to ensure an adequate seal.
- 4. Store samples on ice at 4°C until transport to the laboratory facility.
- Samples should always be collected in duplicate to cover for breakage and or laboratory quality control reanalysis.
- In addition, a third VOA vial (40ml) must be collected for screening and dry weight determination. This third vial must not contain any sample preservation solution.

#### Oily waste samples

The collection of oily samples depends on knowledge of the waste and its solubility in methanol.

- If the oily waste is known to be soluble in methanol, collect the sample in accordance with the technique noted for high concentration soils.
- 2. If the solubility of the oily waste is not known, the sample should either be collected in a vial without a preservative filling the container as full as possible in order to minimize volatile loss in the headspace, or test the solubility of a trial sample in the field. If the trial sample is soluble in methanol, collect the sample in accordance with the technique noted above for high concentration soils. Otherwise, collect an unpreserved sample as described above.

In order to alleviate uncertainties regarding which sample collection technique to use, Spectrum Analytical recommends the collection of all soil samples in accordance with both low and high concentration techniques. Please make certain to submit an additional VOA vial without any sample preservation solution for screening and dry weight determination.

The aforementioned sample containers are immediately available upon request from the laboratory. Be advised to clearly note which preservative is needed when requesting containers, otherwise HCl preserved VOA vials will be provided if no preservative is specified.



#### Memorandum

(M-017)

To:

All Spectrum Analytical Clientele

From:

Sample Department

Date:

March 2, 1999

Subject:

Sample Collection, Preservation and Handling

#### Collection of Samples in Duplicate

The collection of a sample in duplicate is requested when submitting a series of five or more samples per Chain of Custody. Collecting double the volume of a sample will enable us to perform additional quality control procedures in the laboratory. This practice may also be utilized when submitting samples for a project requiring additional quality control information.

#### Dechlorination of Samples

Clients are urged to carefully follow all preservation guidelines as specified in each applicable method. It has been brought to our attention that government agencies are strictly enforcing these guidelines including sample dechlorination. If residual chlorine is present in a sample, follow the instructions outlined below. Pay close attention to the order in which reagents are added to the sample. A brief synopsis of dechlorinating reagents by method is given for your referenced.

#### EPA 524.2

Add 25 mg of ascorbic acid to sample vials before filling. After the vial is filled to overflow, then add one drop of 1:1 HCl for each 20 ml of sample volume. Seal the vial taking care not to trap any air bubbles. Turn vial septa-face down, and shake vigorously for 1 minute. Collect samples in duplicate 40 ml VOA vials.

#### EPA 502.2

Add 25 mg of ascorbic acid or 3 mg of sodium thiosulfate to sample vials before filling. After the vial is filled to overflow, then add one drop of 1:1 HCl for each 20 ml of sample volume. Seal the vial taking care not to trap any air bubbles. Turn vial septa-face down, and shake vigorously for 1 minute. Collect samples in duplicate 40 ml VOA vials.

#### EPA 504.1

Add 3 mg of sodium thiosulfate crystals or 75 µl of sodium thiosulfate solution to sample vials before filling. Seal the vial taking care not to trap any air bubbles. The addition of acid to sample vials is not recommended. Collect samples in duplicate 40ml VOA vials.

#### **EPA 608**

If necessary, samples should be adjusted to a pH range of 5.0 to 9.0 with sodium hydroxide or sulfuric acid. If aldrin is to be determined, add sodium thiosulfate when residual chlorine is present. Collect samples in 1 liter glass containers.

#### EPA 625

If residual chlorine is present, add 80mg of sodium thiosulfate per each liter of water. Collect samples in 1 liter amber glass containers.

The EPA recommends the use of sodium thiosulfate as the dechlorinating reagent in the event that a method allows the use of more than one dechlorinating reagent. One exception to this recommendation is ascorbic acid must be used when vinyl chloride and other gases are measured with a mass spectrometer.

The aforementioned reagents are available from the laboratory. Upon request, VOA vials containing the pre-measured amount of reagent as specified in the method may be supplied. A separate vial containing HCl will be provided for final pH adjustment to <2 when applicable. Be advised to clearly note this requirement when requesting containers, otherwise, HCl preserved VOA vials will be provided.

#### Cooling of Samples

Samples must be chilled to 4°C immediately following collection and packed with a sufficient amount of ice to maintain that temperature until receipt at laboratory facility. EPA protocols do not allow the use of icepacks or ice substitutes because they are unable to reach a cold enough temperature.

Laboratories are required to maintain a record of sample temperature as received. In the event that no temperature blank is submitted with the sample(s), an observation must be made as to whether the sample(s) is cold or ambient upon receipt. A notation of the observed temperature is made on the duplicate of the Chain of Custody for our records. Samples received on ice will be noted as such. Where upon samples are transferred from a refrigerator, the temperature will be recorded as cold and refrigerated.

#### Sample Integrity

Spectrum Analytical is committed to maintaining the integrity of all samples submitted for laboratory analyses. Spectrum has a set criterion that all samples must pass in order to be considered to be of satisfactory condition. The Sample Department will notify the client via facsimile of any samples that may be considered to be of unsatisfactory condition. Analysis of unsatisfactory samples will be conducted only with the written authorization from the client.



The following details Spectrum Analytical's policy regarding collection, preservation and handling of all samples that are submitted for VPH and/or EPH analysis. These guidelines are in accordance with Massachusetts DEP Method for the Determination of Volatile (VPH) and Extractable (EPH) Petroleum Hydrocarbons, January 1998.

#### Sample Collection. Preservation, and Handling for VPH Method

All samples must be cooled to 4 degrees (Celsius) immediately after collection.

A Chain of Custody must accompany all samples submitted for analysis, documenting the time and date of sampling and any preservative addition.

A summary of sample collection, preservation and holding times is provided in Table 1.

#### Aqueous Samples

- Aqueous samples should be collected in duplicate without agitation and without headspace in contaminate-free, HCl preserved, 40ml VOA vial with Teflon-lined septa screw caps. The Teflon liner must come in contact with the sample.
- 2. The laboratory must determine the pH of all water samples unless the laboratory (this must be noted on the Chain of Custody) supplied the sample vials containing acid for field preservation. The pH measurement may be performed on left over sample. Any sample found to have a pH above 2.0 must be so noted on the laboratory/data report sheet.
- A reagent trip blank should accompany each batch of water samples.
- 4. Aqueous samples must be analyzed within 14 days of collection.

#### Soil Samples

Soil samples must be collected in a manner that minimizes sample handling and agitation.
 Samples must be in a Methanol preserved 40ml VOA vial that is provided by Spectrum Analytical. All sediment must be removed from the glass threads of the vial to ensure an adequate seal.

- 2. Methanol preservation of soil samples is mandatory. Methanol (purge and trap grade) must be added to the sample vial before or immediately after sample collection. Spectrum will provide pre-weighed 40 ml VOA vials containing 15 ml of purge and trap grade Methanol for in-field preservation of VPH samples. In lieu of in-field preservation with methanol, soil samples may be obtained in specially-designed air tight sampling devices, provided that the samples are extruded and preserved in methanol within 48 hours of collection. Additional details and recommendations on soil sampling are provided in Appendix 4.
- During collection approximately 15 grams (+/- 25%) of soil must be added to exactly 15ml of Methanol. This may be accomplished visually by adding soil until the layer of soil is approximately equal or just less than the layer of preservative. In all cases, the soil sample in the vial must be completely covered by methanol.
- 4. Samples for VPH analysis should be collected in duplicate 40ml vials. An additional sample of the soil should also be obtained (without Methanol) to allow for a determination of soil moisture content and VPH dry weight correction factors (Remaining soil from EPH method will be sufficient to calculate soil moisture content if applicable).
- 5. A Methanol trip blank should accompany each batch of samples.
- 6. Observations of vial leakage must be so noted on the laboratory/data report sheet.
- 7. Soil and sediment samples must be analyzed within 28 days of collection.

TABLE 1 HOLDING TIMES AND PRESERVATIVES FOR VPH SAMPLES							
Matrix	··· Container	Preservation	Holding Time				
Aqueous Samples	2-40-ml VOC Vials w/ Teflon-lined septa screw caps	Add 3 to 4 drops of 1:1 HCl; cool to 4°C	14 days				
Soil/Sediment Samples	2 VOC Vials w/ Teflon- lined septa screw caps. 40-ml vials: add 15 g soil	1 ml methanol for every g soil; add before or at time of sampling; cool to 4°C	28 days				

#### Sample Collection. Preservation and Handling for EPH Method

All samples must be cooled to 4 degrees (Celsius) immediately after collection.

- - - 275

A Chain of Custody must accompany all samples that are submitted for analysis documenting the time and date of sampling and any preservative addition.

A summary of sample collection, preservation and holding times is provided in Table 2.

#### Aqueous Samples

- Aqueous samples are collected in HCl preserved 1 liter amber glass bottles with Teflonlined screw caps.
- Aqueous samples must be extracted within 14 days of collection, and analyzed within 40 days of extraction.

#### Soil Samples

- Soil and sediment samples are collected in 4oz amber glass jars with Teflon-lined screw caps.
- Soil and sediment samples must be extracted within 7 days of collection, and analyzed within 40 days of extraction.

TABLE 2 HOLDING TIMES AND PRESERVATIVES FOR EPH SAMPLES								
Matrix	Container	Preservation	Holding Time					
Aqueous Samples	1-Liter amber glass bottle with Teflon-lined screw cap	Add 5 ml of 1:1 HCl; cool to 4°C	Samples must be extracted within 14 days and extracts analyzed within 40 days					
Soil/Sediment Samples	4-oz.(120mL) wide mouth amber glass jar with Teflon-lined screw cap.	Cool to 4°C	Samples must be extracted within 7 days and extracts analyzed with 40 days					

# APPENDIX 4 Collecting and Preserving VPH Soil Samples Page 2 of 3

OPTION 2: Use of a Sealed-Tube Sampling/Storage Device

PERFORMANCE STANDARD:

Obtain undisturbed soil sample and immediately seal in airtight container, for shipment to laboratory and immersion in

methanol within 48 hours.

Step 1:

Obtain pre-cleaned and/or disposable samplers/containers that allow the collection and air-tight

storage of at least 15 grams of soil.

Step 2:

In the field, obtain an undisturbed sample from a freshly exposed soil. Immediately seal container, and place in a cooler. Obtain a duplicate sample to enable the determination of soil moisture content (this does not need to be in a sealed sampler/container). Transport to analytical

laboratory using appropriate chain-of-custody procedures and forms.

Step 3:

Samples must be extruded and immersed in purge and trap (or equivalent) grade methanol at the laboratory within 48 hours of sampling, at a ratio of 1 mL methanol to 1 gram soil. In no case, however, shall the level of soil in the laboratory container exceed the level of methanol (i.e., the soil must be completely immersed in methanol).

NOTE: Documentation MUST be provided/available on the ability of the sampler/container to provide an air-tight seal in a manner that results in no statistically significant loss of volatile hydrocarbons for at least 48 hours. To date, only one commercially available product, the En Core Sampler, has provided this level of demonstration.

OPTION 3: Use of Alternative Collection/Storage/Preservation Techniques

PERFORMANCE STANDARD: Obtain and store an undisturbed soil sample in a manner that ensures the chemical integrity of the sample by (1) preventing the volatilization of petroleum hydrocarbons heavier than C5, and (2) preventing the biological degradation of petroleum hydrocarbons.

NOTE: The onus is on the user of such techniques to demonstrate the validity of the procedures used, via reference to published literature and/or other pertinent data.

#### SAFETY

Methanol is a toxic and flammable liquid, and must be handled with appropriate care. Use in a well-vented area, and avoid inhaling methanol vapors. The use of protective gloves is recommended when handling or transferring methanol. Vials of methanol should always be stored in a cooler with ice at all times, away from sources of ignition such as extreme heat or open flames.

#### APPENDIX 4 SHIPPING METHANOL PRESERVED SAMPLES Page 3 of 3

#### Shipping of Hazardous Materials

Methanol is considered a hazardous material by the US Department of Transportation (DOT) and the International Air Transport Association (IATA). Shipments of methanol between the field and the laboratory must conform to the rules established in Title 49 of the Code of Federal Regulations (49 CFR parts 171 to 179), and the most current edition of the IATA Dangerous Goods Regulations. Consult these documents or your shipping company for complete details.

#### Small Quantity Exemption

The volumes of methanol recommended in the VPH method fall under the small quantity exemption of 49 CFR section 173.4. To qualify for this exemption, all of the following must be met:

- the maximum volume of methanol in each sample container must not exceed 30 mL
- the sample container must not be full of methanol
- the sample container must be securely packed and cushioned in an upright position, and be surrounded by a sorbent material capable of absorbing spills from leaks or breakage of sample containers.
- · the package weight must not exceed 64 pounds
- the volume of methanol per shipping container must not exceed 500 mL
- the packaging and shipping container must be strong enough to hold up to the intended use
- the package must not be opened or altered while in transit
- the shipper must mark the shipping container in accordance with shipping dangerous goods in acceptable
  quantities, and provide the statement:

"This package conforms to conditions and limitations specified in 49 CFR 173.4"

#### Shipping Papers

All shipments must be accompanied by shipping papers which include the following:

Proper Shipping Name: Methyl Alcohol Hazardous Class: Flammable Liquid

Identification Number: UN1230

Total Quantity: (mL methanol/container x the number of containers)

Emergency Response Info: Methanol MSDS attached
Emergency Response Phone: provide appropriate number
Shipping Exemption: DOT-E 173.118, Limited Quantity

#### Labeling & Placarding

Labeling and placarding is not required for valid small quantity exemptions (per 173.118)

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# SUBSURFACE SOIL SAMPLE COLLECTION USING AN EARTHPROBETM

The following applicable procedures will be performed during collection of soil samples using a 48-inch macro-core sampler:

- Representative subsurface soil samples will be collected in 4-foot intervals by direct push
  using a clean, decontaminated 48-inch long, 2-inch outside diameter, nickel-plated macrocore sampler containing a dedicated 45-inch long by 1.5-inch inside diameter PETG clear
  plastic liner. Samples obtained from the macro-core sampler are suitable for physical and
  chemical analysis.
- Other equipment used during sampling such as mixing bowls and sampling tools will be made of stainless steel.
- The macro-core sampler will be advanced from the surface to a depth of 4 feet. In order to
  collect samples below four feet, the soil above the sampling interval must be removed. If
  the borehole remains open samples can be collected continuously to the desired depth.
- Careful visual inspection of the sample will be performed to identify different soil in the top
  of the sampler that may have been caused by soil sloughing into the open borehole. In this
  case the judgment of the sampler must be used before completing boring logs or collecting
  representative soil sample. If the borehole does not stay open or if the sloughing of soils is
  excessive, the integrity of the soil samples is jeopardized and the 24-inch large bore sampler
  should be used for sampling below the initial 0- to 4-foot interval.
- Upon retrieval of the macro-core sampler, the following applicable procedures will be followed:
  - The liner will be removed from the sampler and cut open with a pre-decontaminated knife. The soil will be scanned for total volatile organic vapors using a PID or FID and the length of recovery will be measured. This information will be recorded on a boring log. <u>Alternative</u>: A hole will be drilled through the side of the liner, allowing for the collection of a sub-sample using a stainless steel syringe.
  - Soil will be described and logged according to a modified Burmister system. The soil
    description will be given in the following format: soil name; sorting and plasticity;
    particle size distribution, shape, and angularity; color; moisture content; density or
    consistency. This information will be recorded in a field book and on a boring log.
  - Duplicate samples for field screening for total organic vapors will be collected by filling
    two 8-ounce glass soil jars half full with soil and covering the jar with a double layer of
    aluminum foil and securing the lid over the foil. One sample will be collected from the
    top portion of the recovered soil and one from the bottom portion. The sample will be

Procedure found in the Massachusetts Department of Environmental Protection (DEP)
Interim Remediation Waste Management Policy for Petroleum Contaminated Soils
#WSC-94-400. Alternative: If a sample is collected with a stainless steel syringe, this sub-sample can be placed into a 40-ml VOA vial, filling the vial 1/2 full, and then covering the vial with foil prior to capping with the teflon-lined cap.

- Samples for analysis for volatile organic compounds (VOCs and VPH) will be collected directly from the liner using a decontaminated stainless steel tool. No mixing of the soil sample will occur. The tool will be used to transfer the soil samples into duplicate 40-ml VOA vials containing 15 ml methanol. Approximately 10 to 15 grams of soil must be added to the pre-measured, pre-weighed vials. Loose soil will be removed from the glass threads of the vial to ensure a good seal. A third vial, without preservation solution, will be filled with soil and submitted for dry weight analysis. These vials will immediately be placed in a chilled, thermally insulated container. The container will include a trip blank consisting of methanol in a 40-ml vial.
- Grab samples of soils collected from the sampler for laboratory analysis for semivolatile organic compounds, PCBs, pesticides, TPH, EPH, and inorganics will be composited by homogenized by mixing the soil in a stainless steel bowl or a polyethylene bag, or by the following method, if specified. The soil will be placed on a 1-meter square piece of polyethylene sheeting and rolled backward and forward by lifting and releasing the corners of the sheet. The sample will be spread out on the sheet and divided into quarters. Soil will be collected from each quarter consecutively until the sample containers are full. The container lid will be secured tightly. No chemical preservation is necessary.
- Sample containers will be checked to see that a Teflon liner is present in the cap prior to filling. ECS Standard Operating Procedure (SOP) # 4.00 should be referenced for selection of proper sample containers and preservation methods for each analytical method.
- All sample containers will be labeled with the following information: site; project number; earth probe number; sample interval or depth; sample matrix; date; time of collection; testing parameters; grab or composite sample; initials of sampling personnel.
- Sample containers will be capped immediately after filling and cooled to 4°C by placing them into a chilled, thermally insulated container for transport to the laboratory.
- All equipment used to collect samples for analysis will be either decontaminated before
  each use or dedicated to a particular sample location after initial decontamination
  according to the attached procedures.

#### Document No. 11146.81 Revised: May, 2000 Page 1

### GROUNDWATER SAMPLE COLLECTION PROCEDURES USING BAILERS OR PUMPS

The following groundwater sampling protocols are based on standard methods found in ASTM Designation: D4448-85a, USEPA guidance documents (numerous references), and Massachusetts DEP "Standard References for Monitoring Wells" (WSC-310-91).

#### 1. MATERIALS

The following equipment and materials may be used during groundwater sampling. Not all material and equipment is necessary all of the time.

- health and safety equipment;
- map of well locations;
- well keys;
- interface probe;
- electronic water level indicator;
- PID or FID;
- pH, conductivity, and temperature meters; or a water quality monitoring system (pH, conductivity, temperature, ORP, and optional dissolved oxygen);
- · field book;
- disposable gloves;
- stainless-steel, Teflon ™ or PVC, bailers with Teflon check valves;
- dedicated polypropylene cord;
- bucket (calibrated in gallons);
- sample containers and labels;
- chain-of-custody forms;
- · cooler and cold source;
- · decontamination equipment;
- · polyethylene sheeting;
- · polyethylene tubing and check valve;
- field filtering apparatus.

Pre-decontaminated bailers will be wrapped in an inert material (i.e. plastic bags) and stored in a clean environment during transport to the Site (See Decontamination Procedures).

In order to ensure the collection of groundwater samples representative of the aquifer, the standing water within the well is first purged. Note: Depth to water level measurements will be performed in each monitoring well prior to purging and sampling (see Water-Level Measurement Procedures).

#### 2.0 WELL PURGING

- An interface probe or electronic water level indicator will be lowered to the air-water interface and the depth to water and depth of the well will be recorded. If the presence of a free phase product (light non-aqueous phase liquid - LNAPL) is suspected, an interface probe will be lowered to the product-water interface and the thickness of the product will be measured. Depth of the well will not be measured if LNAPL is present.
- If no free phase product is present in the well purging will begin:
  - Groundwater will be purged from the well using a decontaminated stainless-steel or PVC bottom-emptying bailer equipped with a Teflon™ check valve, or a noncontaminating water pump.
  - Groundwater collected during purging and sampling of groundwater monitoring wells
    will be discharged to the subsurface at the point of withdrawal in accordance with
    Massachusetts General Law Chapter 21E and 310 CMR 40.0056 of the Massachusetts
    Contingency Plan. If purge water is grossly contaminated (i.e. contains free phase
    product) this water will be drummed and disposed of according to applicable municipal,
    state, and federal regulations (See Disposal Procedures).
  - When using a pump, clean, dedicated polyethylene tubing will be used for each well. In appropriate situations, the polyethylene tubing can be stored in the well casing for use during future sampling events.
  - When using dedicated stainless-steel, PVC, or Teflon™ bailers to purge the wells, a separate pre-decontaminated bailer will be used for each well.
  - The bailer will be suspended with disposable/dedicated polypropylene cord. Care will be taken that the cord does not touch the ground during sampling and purging. The cord will be discarded upon completion of each well sampling event.
  - Non-dedicated bailers will be decontaminated in the field between each well sampling event according to Decontamination Procedures.
  - One of the following procedures will be used to determine if the purging is complete:
    - A. The efficiency of purging will be verified by measuring changes in the temperature, pH, and specific conductance (in-situ parameters) of well water during purging. The stabilization of pH, temperature, and conductivity readings for two consecutive measurements, indicates that " stagnant water" has been removed from the well and that aquifer formation water (groundwater) is now entering the well. Stabilization will be defined as the following; The pH measurements should be to within ± 0.1 pH unit, the

temperature to within ± 1.0°C, and specific conductance to within ± 10 umhos/cm for two consecutive readings.

- B. An alternative method for determining if purging is complete may be used where the use of this method meets the assessment objectives. In this case, the well will be pumped or bailed until a specified volume of water has been removed from the well, commonly a minimum of 3 to 5 well bore volumes. In wells screened within low permeability formations, the well may go "dry" prior to the removal of 3 to 5 volumes. Purging is considered complete in this case. However, the complete draining of a well will be avoided if possible during the purging process because of the potential loss of volatiles.
- For complete purging of "stagnant water" (using either a pump or a bailer) the removal
  of well water will occur from just below the air-water interface in the well. In some
  situations, when using a pump, the pump intake may be lowered to remain just below
  the water surface as pumping is in progress. If the well screen is 20 feet or longer,
  groundwater will be pumped or bailed from the mid-point of the screen.
- The temperature, conductivity, and pH of the first well volume will be recorded using
  individual pH, conductivity, and temperature meters or a water quality monitoring
  system. These parameters may be measured following the removal of each subsequent
  well volume. If specified, oxidation reduction potential will also be recorded.
- The volume of purge water will be measured by pumping or bailing groundwater directly into a container of known volume.
- When using a pump for purging, a water quality monitoring system can be connected to the pump discharge in order to monitor the in-situ parameters. In-situ parameters may be alternatively monitored in a beaker filled from the bailer or the pump discharge.
- When bailing, care will be taken to assure that the bailer cord is held in the hand or
  placed upon plastic surrounding the well to prevent the potential of cross contamination
  from the ground surface to the well.
- The volume of water purged from the well, the measurements of temperature, pH, and specific conductivity, and observations of color, odor, and turbidity will be recorded on a sampling log. An example of the ECS Groundwater Sampling Log is attached.
- All measuring equipment will be decontaminated between uses (See Decontamination Protocols). The groundwater measuring equipment will be calibrated daily prior to use and in the field if field personnel suspect a problem with the calibration.

When using dedicated bailers, the stainless-steel bailers will be rinsed with clean
potable water following sample collection and placed in a plastic bag for transport to the
company's facility where decontamination will take place (See Decontamination
Procedures).

#### 3.0 GROUNDWATER SAMPLING PROTOCOL

- Water samples for the analysis of volatile organic compounds (VOCs) (including volatile
  petroleum hydrocarbons) will be collected as soon as the well has sufficiently recovered
  from purging and within three hours of purging. Samples for the analysis for VOCs will be
  collected from the first volume of water collected from the top of the water column in the
  well.
- Groundwater samples collected for the analysis of VOCs will be collected in duplicate 40-milliliter glass vials with zero headspace. Vials will be pre-preserved with hydrochloric acid to a pH of <2. The vial will be uncapped carefully in order to avoid contact with the Teflon septum. The vial will be filled slowly taking care to not to agitate the sample when transferring it from the bailer to the sample vial. Each vial will be filled until there is a meniscus over the lip of the vial. If no meniscus forms, a sample of water will be collected in the cap and poured slowly into the vial to create a meniscus. The Teflon-faced septum will be placed on the convex meniscus and the cap screwed down. The vial will be inverted and tapped to check for the presence of air bubbles. If air bubbles are present, the sample will be discarded and another vial will be selected and filled.</p>
- Groundwater samples for analysis for PCBs, pesticides, total and extractable petroleum hydrocarbons, semivolatiles organic compounds, metals, other inorganic compounds, and general chemical parameters, will be collected last. Assuming adequate recharge, all samples will be collected within 3 hours of purging or upon 90% recovery.
- Groundwater samples for the analysis for dissolved (soluble) metals will be collected by
  using HDPE tubing with a decontaminated checkvalve and an in-line dedicated 0.45 micron
  filter. Care will be taken to pump the sample with very gentle pressure, in order to avoid
  any potential failure of the cartridge filter. The sample will be collected directly in a 1-liter
  HDPE bottle pre-preserved with natic acid to achieve a pH <2.</li>
- The sample containers for groundwater samples collected for all analyses other than VOCs will be filled to 90% capacity. Care will be taken so that no portion of the sample comes in contact with the sampler's gloves. ECS Standard Operating Procedure (SOP) # 4.00 should be referenced for selection of proper sample containers and preservation methods for each analytical method.
- Duplicate samples, field blanks, and equipment rinsate blanks will be collected according to specified QA/QC frequency

- A trip blank consisting of deionized hydrocarbon-free laboratory water in a 40-milliliter Teflon-septum vial, prepared prior to sampling, will be present with the volatile samples at all times during sampling and transportation to the analytical laboratory, and will be subjected to the same analyses as the samples.
- All sample containers will be capped immediately after filling. The exterior of the
  container will be rinsed with deionized water and dried with paper towels. Samples will be
  cooled to 4°C by placing them immediately in a chilled, thermally insulated container with
  a cold source;
- All sample containers will be labeled immediately upon collection with the following information: site; project number; well number; date; time of collection; testing parameters; initials of sampling personnel.
- All equipment used to collect samples for analysis will be either decontaminated before each use or dedicated to a particular sample location after initial decontamination.
- Based on the results of previous sampling and analysis, sampling will progress from the least contaminated well to the most contaminated well.
- All groundwater samples will be immediately placed in a chilled, thermally-insulated container and submitted as soon as possible to a Massachusetts-certified analytical laboratory under Chain of Custody protocol. Information regarding sample holding times is found in Table 1. Information regarding Chain of Custody protocol is found in the Sample Custody Procedure.

## GROUNDWATER SAMPLE COLLECTION PROCEDURES USING LOW FLOW SAMPLING METHODOLOGY

The following groundwater sampling protocols are based on the USEPA low flow purge and sampling procedure (Region 1 Low Flow SOP #: GW 0001) with the following modifications.

#### 1. MATERIALS

The following equipment and materials may be used during groundwater sampling. Not all material and equipment is necessary all of the time.

- · health and safety equipment;
- map of well locations;
- well keys;
- · interface probe;
- electronic water level indicator;
- PID or FID;
- a multiprobe water quality monitoring system (pH, specific conductivity, temperature, ORP, and optional dissolved oxygen)-i.e. Geotech Multiprobe Sampling System™ or YSI Model 3560 Water Quality Monitoring System™
- field book;
- · adjustable rate peristaltic pump;
- 3/16-inch inside diameter and 1/4-inch outside diameter polyethylene tubing;
- ¼-inch inside diameter silicone tubing;
- cable ties;
- folding table;
- disposable gloves;
- bucket (calibrated in gallons);
- sample containers and labels;
- · chain-of-custody forms;
- · cooler and ice;
- decontamination equipment;
- polyethylene sheeting;
- field filtering apparatus.

In order to ensure the collection of groundwater samples representative of the aquifer, the standing water within the well is first purged. Note: Depth to water level measurements will be performed in each monitoring well prior to purging and sampling (see Water-Level Measurement Procedures).

#### 2.0 WELL PURGING

- An interface probe or electronic water level indicator will be lowered to the air-water
  interface and the depth to water and depth of the well will be recorded. If the presence of a
  free phase product (light non-aqueous phase liquid LNAPL) is suspected, an interface
  probe will be lowered to the product-water interface and the thickness of the product will be
  measured. Depth of the well will not be measured if LNAPL is present and the well will
  not be sampled using the low flow sampling procedure.
- . If no free phase product is present in the well purging will begin.
  - Purging of each well prior to sampling is conducted using an adjustable rate peristaltic
    pump in line with a multiprobe water quality monitoring system. This instrument
    allows for the visual monitoring of five parameters (temperature, pH, specific
    conductivity, dissolved oxygen and Eh -- oxidation-reduction potential)
    simultaneously in real time. This system uses an adjustable rate peristaltic pump
    system to collect the purge water directly into a flow-through chamber assembly
    containing the parameter probes.
  - A dedicated polyethylene tubing of 3/16-inch inside diameter and ¼-inch outside diameter is tied flush with the tip of a water-level measurement indicator using a plastic cable tie and is lowered into the well casing until it is in the center of the water column.
  - A dedicated section, approximately one foot long, of 1/4-inch inside diameter silicone
    tubing is fit through the peristaltic pump. The silicone tubing connects the dedicated
    polyethylene tubing from the well to a small piece of polyethylene tubing
    (approximately 24-inch), which attaches to the flow-through chamber of the
    multiprobe water quality monitoring system.
  - The pump is started at its highest speed setting until the purge water is directly
    discharged into the chamber. Once the chamber is filled with purge water, the
    multiprobe meter displays are turned on displaying the initial stabilization parameter
    measurements. The volume of purge water will be measured by pumping groundwater
    directly into a container of known volume.
  - The pumping rate is slowed once the chamber is filled with purge water to a rate of approximately 0.1 gallons per minute or as appropriate such that drawdown of the water level does not exceed 0.3 feet. The water level inside the well casing is monitored every three to five minutes or approximately every 0.5 gallons during purging to ensure drawdown does not exceed 0.3 feet.

- Parameters are recorded and logged every 0.5-gallon until the amount of water purged approaches the minimum purge amount of three times the well volume. After purging the minimum amount of water from the well, the parameters are recorded and logged every 0.25-gallon until stabilization occurs. Field measurement data is recorded for each well during the purging process in a field notebook.
- The volume of water purged from the well, field measurement data (temperature, pH, specific conductance, dissolved oxygen and Eh) along with observations of color, odor and turbidity are recorded for each well during the purging process in a field notebook or sampling log. An example of the ECS Low Flow Groundwater Sampling Log is attached.
- · Purging is performed until the following requirements have been met:
  - A. A minimum of three well volumes are extracted from the well without exceeding a drawdown on 0.3 feet.
  - B. The measured field parameters stabilize within +/- 0.1 pH units, +/- 1.0 degrees Celsius and within +/- 10 μmhos/cm for specific conductance.
  - C. Stabilization of pH, temperature and specific conductivity occurred for three or more consecutive measurements during three to five minute intervals.
- All measuring equipment will be decontaminated between uses (See Decontamination Protocols). The groundwater measuring equipment will be calibrated daily prior to use and in the field if field personnel suspect a problem with the calibration.
- Groundwater collected during purging and sampling of groundwater monitoring wells
  will be discharged to the subsurface at the point of withdrawal in accordance with
  Massachusetts General Law Chapter 21E and 310 CMR 40.0056 of the Massachusetts
  Contingency Plan. If purge water is grossly contaminated (i.e. contains free phase
  product) this water will be drummed and disposed of according to applicable municipal,
  state, and federal regulations (See Disposal Procedures).

#### 3.0 GROUNDWATER SAMPLING PROTOCOL USING PERISTALTIC PUMP

- Once stabilization of the groundwater parameters occurs, the sampling of the groundwater from the well begins. Groundwater sampling may be performed with bailers according to ECS SOP 8.10 or using the peristaltic pump and dedicated polyethyene tubing. The following SOP describes groundwater sampling using the peristaltic pump, the dedicated section of silicon tubing, and the dedicated section of polyethylene tubing in the well.
- Immediately prior to sampling, the polyethylene tube leading to the flow-through chamber
  of the multiprobe water quality monitoring system is disconnected so that the groundwater
  flows directly from the ¼-inch silicone tubing into the sample vials.
- The location of the sampling point (or position of the end of the dedicated in-well tubing)
  will generally be the middle of the screened interval. Knowledge of specific layers of
  contamination may change this sampling point.
- Water samples for the analysis of volatile organic compounds (VOCs) and volatile
  petroleum hydrocarbons (VPH) will be collected first from the tubing in the water column
  in the well.
- Groundwater samples collected for the analysis of VOCs and will be collected in duplicate 40-milliliter glass vials with zero headspace. Vials will be pre-preserved with hydrochloric acid to a pH of <2. The vial will be uncapped carefully in order to avoid contact with the Teflon septum. The vial will be filled slowly taking care not to agitate the sample which may mean slowing down the rate of the peristaltic pump. Each vial will be filled until there is a meniscus over the lip of the vial. If no meniscus forms, a sample of water will be collected in the cap and poured slowly into the vial to create a meniscus. The Teflon-faced septum will be placed on the convex meniscus and the cap screwed down. The vial will be inverted and tapped to check for the presence of air bubbles. If air bubbles are present, the sample will be discarded and another vial will be selected and filled.</p>
- Groundwater samples for analysis for PCBs, pesticides, total petroleum hydrocarbons, extractable petroleum hydrocarbons (EPH), semivolatiles organic compounds, metals, other inorganic compounds, and general chemical parameters, will be collected last but immediately after collecting groundwater samples for analysis of VOCs.
- Groundwater samples for the analysis for dissolved (soluble) metals will be collected by connecting a dedicated 0.45 micron filter in-line to the ¼-inch silicone tubing. Care will be taken to adjust the pumping rate, in order to avoid any potential failure of the cartridge filter. The sample will be collected directly in a 1-liter HDPE bottle pre-preserved with nitric acid to achieve a pH <2.</li>
- The sample containers for groundwater samples collected for all analyses other than VOCs will be filled to 90% capacity. Care will be taken so that no portion of the sample comes in contact with the sampler's gloves. ECS Standard Operating Procedure (SOP) # 4.00 should

be referenced for selection of proper sample containers and preservation methods for each analytical method.

- Duplicate samples, field blanks, and equipment rinsate blanks will be collected according to specified QA/QC frequency
- A trip blank consisting of deionized hydrocarbon-free laboratory water in a 40-milliliter Teflon-septum vial, prepared prior to sampling, will be present with the volatile samples at all times during sampling and transportation to the analytical laboratory, and will be subjected to the same analyses as the samples.
- All sample containers will be capped immediately after filling. The exterior of the
  container will be rinsed with deionized water and dried with paper towels. All sample
  containers will be labeled immediately upon collection with the following information: site;
  project number; well number; date; time of collection; testing parameters; initials of
  sampling personnel.
- All groundwater samples will be cooled to 4°C by placing them immediately in a chilled, thermally insulated container with ice and submitted as soon as possible to a Massachusettscertified analytical laboratory under Chain of Custody protocol. Information regarding sample holding times is found in Table 1. Information regarding Chain of Custody protocol is found in the Sample Custody Procedure.
- All equipment used to collect samples for analysis will be either decontaminated before
  each use or dedicated to a particular sample location after initial decontamination.
- Based on the results of previous sampling and analysis, sampling will progress from the least contaminated well to the most contaminated well.

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# Depth to water-level measurements are taken to determine the elevation of the potentiometric surface. Water level measurements will be performed in each monitoring well prior to sampling. Because of fluctuating groundwater levels, all wells will be measured prior to sampling and within the same day, if possible. If the presence of NAPL is suspected, measurements will be made with an oil/water interface probe, otherwise, an electronic water level indicator will be used. These instruments are accurate to 0.01 feet. The following procedures are based on Massachusetts DEP guidelines (DEP, 1991) and ASTM Designations D 5092 - 90 and D

WATER-LEVEL MEASUREMENT PROCEDURES

- The measuring instrument will be decontaminated prior to use and between wells according
  to the standard decontamination procedures.
- Measurements will progress from the least contaminated wells to the most contaminated wells.
- The well casing will be opened and the headspace will be monitored for total organic vapors using a PID or FID. If a reading of 5 ppm or greater is detected, the well will be allowed to vent for 5 to 10 minutes. If after this time the reading is 5 ppm or greater, a determination regarding the level of personal protective equipment needed will be made before sampling continues. If specified, PID or FID readings for well casing headspace will be recorded for each well.
- An interface probe will be lowered to the air-water interface and the depth to water will be
  recorded. The interface probe will be lowered to the bottom of the well to measure the
  depth of the well and in wells where chlorinated hydrocarbons were detected to determine if
  dense non-aqueous phase liquid (DNAPL) is present. If the presence of a free phase
  product (LNAPL) is indicated, the probe will be lowered to the product-water interface and
  the thickness of the product will be recorded but the depth of the well will not be measured.
- One water-level measurement will be made from a reference point on the PVC well riser
  pipe and another from the top of the protective well casing at the surface elevation. The
  reference point on the PVC will be a V-notch cut into the top edge of the riser pipe at the
  highest point. This will be the surveyed point on the riser. The reference point on the well
  riser is preferred for determining depth to water-level due to its stability. The protective
  well casing is more susceptible to movement through settling, frost heaving, or
  displacement by impact.

- The volume of standing water in the well (static volume) will be calculated and used during well purging prior to sampling.
- The total depth of the well, depth to product, depth to water, standing water height, and static volume will be recorded on the groundwater sampling log (attached).

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#### DECONTAMINATION

Decontamination will be performed in order to: minimize the spread of contaminants on the Site and from one sampling location to another; reduce the potential exposure of field personnel to contaminants; and to ensure good data quality and reliability. Decontamination of all field analytical testing and sampling equipment will be performed according to the following procedures. These procedures are based on ASTM Designation D 5088-90, USEPA CERCLA QAPP Review Guidance, 1987, and Massachusetts DEP Standard Reference for Monitoring Wells, 1991.

Equipment cleaning procedures include pre-field, field, and post-field decontamination. Non-disposable equipment will be decontaminated after completing each sampling event. In cases of gross contamination (free phase product), rinse water will be contained for proper disposal according to municipal, state, and federal regulations. Decontamination procedures will be monitored through sampling and analysis when quality assurance/quality control checks are necessary.

Equipment will be dedicated to each sampling point and decontamination will be performed at the off-site facility as much as possible.

Decontaminated equipment will be rested on polyethylene sheeting at each sampling point.

Samplers will use new disposable gloves at each sampling point.

Potable water from the public water supply will be used for control rinse water.

A certified laboratory supply of deionized water will be used for decontamination of field testing and sampling equipment and for the collection of rinsate blanks. Deionized water will be stored in Nalgene, glass, or Teflon containers. The storage area containing the deionized water will be separated from the storage area for solvents.

Equipment rinsate blanks will be collected when a quality control check of the decontamination procedure is necessary. This check will not be performed if dedicated equipment is used. One blank will be collected at least once during a sampling event for each different piece of sampling equipment used. Rinsate blanks will be prepared by pouring deionized water over the decontaminated piece of equipment and collecting it in the sample container. The equipment rinsate blank will be analyzed for the same analytes as the samples that have been collected with that piece of equipment.

#### 1.0 MATERIALS

- health and safety equipment;
- · laboratory-supplied deionized water;
- · phosphate-free detergent (Alconox, Liquinox);
- potable water (municipal water source);
- · methanol;
- Hexane;
- Acetone:
- · nitric acid rinse solution;
- · wash basins:
- · inert brushes;
- · polyethylene sheeting;
- large heavy duty garbage bags;
- · spray bottles;
- · zip-lock bags;
- paper towels/Handiwipes;
- disposable gloves.

#### 2.0 DECONTAMINATION PROCEDURES

- Stainless steel bailers will be disassembled, soaked in hot potable water and scrubbed with a
  brush in "Alconox" detergent and potable water, and rinsed with clean potable water at the
  company's facility. Bailers will be allowed to air dry in a vertical position in a contaminantfree environment.
- Prior to the sampling event, bailers used for the collection of samples which will undergo analysis for total petroleum hydrocarbons and volatile organic compounds will be rinsed with hot potable water followed by a 10% methanol solution of pesticide grade methanol and deionized water, followed by a final rinse with deionized water. The volume of deionized water will be at least five times the volume of the methanol. Bailers used for the collection of samples which will undergo analysis for semi-volatile organic compounds, PCBs, and pesticides will be rinsed with a technical grade acetone followed by a pesticide grade hexane, and a final deionized water rinse as above. Bailers used for the collection of groundwater samples which will undergo analysis for metals will be rinsed with 10 per cent nitric acid solution prepared from reagent grade nitric acid and deionized water followed by a potable water rinse, and a final deionized water rinse.
- Bailers will be wrapped in an inert material (i.e. plastic bags) and stored in a clean environment during transport to the Site.

- Following sample collection, the stainless-steel bailers will be rinsed with clean potable water and placed in a plastic bag for transport to the company's facility where decontamination will take place.
- Soil and sediment sampling equipment (stainless steel sampling scoop, tool, and bowl, splitspoon and macro-core sampler, knife) will be decontaminated in the field after each use.
- Soil and sediment sampling equipment will be decontaminated as follows: scrubbed with inert brushes in a bucket containing phosphate-free detergent and potable water; rinsed with potable water; rinsed with pesticide grade methanol; and finally rinsed with deionized water. The final potable water and deionized water rinse volumes will equal 5 times the volume of the methanol rinse. The equipment will be allowed to air dry and will be stored in a clean environment until reused.
- Non-dedicated field equipment used for the collection of samples to be analyzed for metals
  and filtering apparatus will be cleaned prior to each use by using a phosphate-free detergent
  solution, a potable water rinse, followed by a 10 percent nitric acid rinse solution prepared
  from reagent grade nitric acid and deionized water, a potable water rinse, and a final rinse
  with deionized water. Used filters will be properly disposed of.
- The YSI Water Quality Monitoring System™, Geotech Multi Parameter™ meter, interface probe, down-hole slug test equipment, QED Water Wizard well development equipment, and other measuring instruments will be decontaminated between uses by rinsing with Alconox or Liquinox, followed by potable water and deionized water rinses. A methanol rinse will be utilized prior to the deionized water rinse in the event of gross contamination such as contact with free-phase product.
- The drill rig and earthprobe and all drilling equipment and associated tools, including but not limited to augers, drill casing, drill rods, sampling equipment, and wrenches, will be steam cleaned prior to beginning the drilling on the Site. This cleaning will consist of using a high pressure detergent steam cleaning equipment, followed by a nanograde methanol swabbing if gross contamination was present. This will be followed by a controlled water rinse. Any down-hole equipment (auger flights, rods, sampling equipment, etc.) coming in contact with gross contamination (i.e. free phase product) will be steam-cleaned between uses. Otherwise equipment will be scrubbed manually with potable water and Alconox as needed to remove soil between uses.
- Sampling equipment and probes will be decontaminated in an area covered by polyethylene sheeting adjacent to the sampling location.
- In cases of gross contamination (i.e. free phase product) rinse water will be collected for proper disposal according to municipal, state or federal regulations. Contaminated solids (disposable gloves, clothing, polyethylene tubing and sheeting, etc.) will be collected and characterized for proper disposal.

- Decontamination procedures will be fully documented in the field notebook. The following
  information should be recorded: Site location, date, time and weather; sample location
  where equipment used; location where decontamination was performed; field personnel
  performing the decontamination; decontamination procedures; disposal of rinse water if
  necessary; samples collected for QA/QC and analytical results.
- Health and safety procedures associated with decontamination are found in the Health and Safety Plan.

#### SAMPLE CUSTODY PROCEDURES

- Sample custody procedures will be followed in order to create an accurate written record.
  This record can be used to trace the possession and handling of all samples from collection,
  through all transfers of custody until the samples are delivered to the analytical laboratory.
  Custody for samples will be maintained by field personnel collecting the samples. The
  following procedures are based on ASTM Designation D 4840-88, standard methods found
  in DEP (1991), and USPEA (1987) guidance documents.
- A self-adhesive waterproof sample label will be affixed to each sample container before sample collection. A waterproof pen will be used to record the following information on the label:

Project Number
Sample ID Number
Sample Location
Sample Matrix
Date and Time of Sample Collection
Designation as Grab or Composite Sample
Parameters to be Tested
Preservative
Initials of Sampler

- All sample containers will be supplied by a state-certified laboratory. Commercially
  purchased sample containers will be pre-cleaned and quality controlled according to EPA
  recommended washing procedures and specifications (Level I and/or Level A according to
  the vendor's specifications). Custody of the sample containers will be maintained by the
  Project Manager and will be relinquished to the field personnel collecting the samples after
  verification that the proper containers have been assigned for the proper sampling task.
- Chemical preservatives will be added to the sample containers by the state-certified laboratory providing the containers. Tables 1 and 2 indicate the type of preservation which will be used.
- Chain-of-custody records will be filled out by the sampler using information from the sample labels. The chain-of-custody will include the dates and times of collection and receipt. The chain-of-custody will document any tampering that may have occurred; if there are no such comments then no tampering was observed. An example of the chain of custody (provided by Spectrum Analytical, Inc. of Agawam, Massachusetts) is included.

- One chain-of-custody record will be used for each packaged lot of samples. More than one chain-of-custody may be used for one packaged lot.
- Samples will be stored in a thermally insulated container with ice. EPA protocols do not allow the use of ice packs or ice substitutes because they are unable to reach or maintain a cold enough temperature. The samples will be delivered to a state-certified laboratory by a member of the sampling team within 24 hours of sample collection. The field chain-of-custody records completed at the time of sample collection will be placed inside the cooler for transport to the laboratory. These forms will be sealed in a zip-lock type plastic bag to protect them against moisture. Each cooler will contain sufficient ice to insure that a 4°C temperature is maintained, and will be packed in a manner to prevent damage to the sample containers.
- The chain-of-custody form will be signed by the relinquishing party and the receiving party.
   The reason for transfer will be indicated each time the sample custody changes. Internal laboratory records will document sample custody until its final disposition.

# ATTACHMENT IV Soil Boring Logs

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F:/data/projects/13997/13997 Boring Logs

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F	NATIONAL PROPERTY AND ADDRESS OF THE PARTY AND	values repres	ent total organi	ic valoors» (OVs (i	reservenced to a benze	ene standard) mea	sured in the beader	ace of sealed soil \$1	arribio iars with a	m minu M	IOCEL P

AND THE PARTY AND THE	and which the Affect	Charles Walters Title 1	2 00 00			BORING NO. TUTAL		P-3	
Action 7	7年20年7月				0	Commence of the Commence of the		7-3	
the mind of the fall in	ntal Complianc	医斯克 (17) (17) (17) (17) (17) (17)		NG and MONITORI		DOCUMENT NO. 1.		12 25 15 16	
588 Salver Str	reel, Agewern, Mess	achusatts 01001		ISTALLATION LOG	7 40 60 2	SHEET HE THE SALE	1	OF	1
系細胞外	湖南縣。站	说图[] [] []	14 - 14	1.6			LOCATION		10400000000000
nvironmental	1 Compliance S	ervices, Inc.	JOB NUMBER:				Christian Services		1
88 Silver Stre	eet, Agawam, N	dassachusetts	PROJECT NAME						-
licholas Cardi	Fnall		PROJECT ADDRESS:	115 Wayside Aven	pe. W. Sofd	See	Site P	lan	
an Dietzier	200		WANTED THE PARTY OF THE PARTY O	Trailerworks, Inc.	act in other				7
	Validad (Smith)	out the first price and	CASING	SAMPLER	CONE BARREL	1			
ATER OBSERVA		NEW TOWN	N/A	And the second second by the second	N/A	Casing Elevation (ft.)	-	1000	-
Depth 1	Statistization Time	TYPE		, 4' Macro		Carlotte Control of the Charles Service	-		
		INSIDE DIAMETER	1.125*			PVC Elevation (ft.)		-	
5555		HAMMER WEIGHT				Surface Elevation (1.)		rina	
		HAMMER FALL				Date Started 17		5/00	
		NOTES	Earth Probe			Date Completed 11	7/2	5/00	
Sample Depths	Penetration/ Recovery	Blows per 6	Strata Changes		Sal Descriptions		Well As Built	Field Testing	Notes
0-2'	1 menuncial	W. Predika programme Contra	SAND	dark brown, fine SA	AND	SCC THE STORY OF THE SCC.	- TANK OF BEILDING	0.2	1
0.2			Shirts				- 1		
2.0	-		-	dark brown, fine SA	AND			BDL	-
2-4'		in the	4	2.7				DUL	100
1.41			- 5	dark brown, fine SA	AND		1	3	
4-6'				dark brown, line or	410			-	
			-	dark brown / gray,	fine SAND	2	3	3.4	-
6-8'				and and and a				3.4	
			4			- 4			-
8-10'			4	dark brown / gray.	fine SAND		100	1,4	-
							8 8	11	
10-12			1	dark brown / gray,	fine SAND			5.4	
				gray medium/fine S	SAND				
12-14'	100			g.c/ madalanting c				5	
570587			]	tetan sweateractic consequent					
14-16"	C000	200	Ä.	brown / gray, medi	um/fine SAND		4 1	1.4	2
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values Detect	repre	represent total organ	represent total organic vapors-TOVs (	represent total organic vapors-TOVs (referenced to a benz or, Results reported in parts per million (ppm). Detection L	represent total organic vapors- TOVs (referenced to a benzene standard) mea- or, Results reported in parts per million (ppm). Detection Limits - 0.2 ppm. BD	represent total organic vapors- TOVs (referenced to a benzene standard) measured in the heads or, Results reported in parts per million (ppm). Detection Limits = 0.2 ppm. BDL = Below Detection	represent total organic vapors- TOVs (referenced to a benzene standard) measured in the headspace of sealed soil sor. Results reported in parts per million (ppm). Detection Limits - 0,2 ppm. BDL = Below Detection Limits.	represent total organic vapors- TOVs (referenced to a benzene standard) measured in the headspace of sealed soil sample jars with a or. Results reported in parts per million (ppm). Detection Limits - 0.2 ppm. BDL = Below Detection Limits.	represent total organic vapors- TOVs (referenced to a benzene standard) measured in the headspace of sealed soil sample jars with an Hnu Mor, Results reported in parts per million (ppm). Detection Limits - 0.2 ppm. BDL = Below Detection Limits.

Groundwater encountered at approximately 14 feet below grade.

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1	4	HIE SALL	A CONTRACTOR	<b>公司</b>		.5.	- 10 m		NO.	E	P-4	160
1		Environme	ntal Compliance	e Services, Inc.	SOIL BORI	NG and MONITO	RING WELL		ENT NO.	-	18	Telegram
M	-		treet Agaward, Mass		18	STALLATION LO	OG	SHEET	SEME.	1	OF.	1
1					1M			1	A STATE OF THE PARTY OF	LOCATION	Par Chie	-
900	COCH CONTRACT	Earles .	LComplian	Candors to		13997.00				LUCATION		-
BORING			et, Agawam,		Constitution, programme for	13391.00		-				
COURM	TY.			Massachusetts	PROJECT NAME:			4	C	Cita D		20
OREM	The second second	Nicholas Car			PROJECT ADDRESS			-	See	Site P	ian	43
ECSINS	PECTOR:	Karl Dietzler	-		CLENT NAME:	Trailerworks, Inc.			¥.			300
-04	GROUND	WATER OBSERV	ATIONS -	理定台場話器院	CASING	SAMPLER	CORE BARREL			(B)		3 20 )
- 17	and the first	Depth	Stabilization Time	TYPE与直接保护	N/A	4' Macro	NIA	Casing E	levation (ft.)		-133	
				INSIDE DIAMETER	1,125*			PVC De	reation (ft.)			
				HAMMER WEIGHT				Surface	Elevation (ft.)			
	-			HAMMER FALL			7	Date Sta	rted	7/2	5/00	
-		-	100 100 10	NOTES:	Earth Probe		-		mpeted 1	7/2	5/00	
30.	775114794	eroski oraza	man a supplication of	AND DESCRIPTION OF THE PARTY AND ADDRESS OF THE PARTY ADDRESS OF	STREET, CONTRACTOR	ANT BURNELL MARKET	Mary Lings Maren	PERSONAL PROPERTY.	O' OR STATE OF THE		Letter 5	STEPS WAS
Depth	Sample Number	Sample Depths	Penetration/ Recovery	Blows per 6"." penetration	Strata Changes	(46. T.U.)	Soil Description			Well As Built	Field Testing	Notes
0		0-2'			SAND	dark brown/gray,	fine SAND	100	re. V.		52	1
						1 No. 100						Jan. 1
		2-4"			SILT	gray silt to 4° bro	wn SILT		1		100	
1	_	-							74	18	-	
4	-0.7	4-6"			1	brown SILT				- 1	3.6	
2		-						_	-			
3		6-8*		1	1	gray SILT					1.4	
- 3	-	- 50			1	0.000			- 1			
8		8-10'			SAND		21112				1.2	-
	-	0-10			SANO	gray medium/fine	SAND		- 6		1.2	
- 1		10.10	-	-		gray medlum/fine	CAND		-		6.0	
		10-12		-	-	ay modulivine	JANU				8.8	-
40	-	10.411			1	gray to light brow	n, medium/fine SA	ONA			44.0	
12	_	12-14"			1						11.2	
	-	47.70			-			w.		6 4	-	-
		14-16'		-	-	dark gray / drang	e, medium/fine SA	MD	200		· 26	2
2523						100			3			
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1		9.97		1	1	1				10000	1. 1/	10000

<sup>1.</sup> Field testing values represent total organic vapors- TOV's (referenced to a benzene standard) measured in the headspace of sealed soil sample jars with an Hnu Model PID - Photolonization Detector. Results reported in parts per million (ppm). Detection Limits - 0.2 ppm. BDL = Below Detection Limits.

Groundwater encountered at approximately 14 feet below grade.

K.	A	Environmen	tal Compliance	Services, Inc.	SOIL BOR	ING and MONITOR	NG WELL	BORING NO.: 1.		P-5	175
L	-	107-127-1011- chill's	THE RESERVE AND THE PARTY OF	sechusets 01001	. 0	STALLATION LOC	Carlot and	SHEET	1	i for I	1
4	1			<b>建</b>	- 1	8 . W. 75	47-11-12-12	27(20) A 12(2) 20(3) 4	LOCATION	Tower and St	
MO	COMPANY	Environmental	Compliance S	anices for	JOB NUMBER:	100			LOCATION	-	-
NG	COMPANY	588 Silver Stre	The state of the s	NAME OF TAXABLE PARTY.	PROJECT NAME:						
ees Ema	COMPANY	Nicholas Cardi			PROJECT ADDRESS	115 Wayside Aven	Je, W. Sold	Sec	Site P	lan	
		Karl Dietzler	-		CLIENT NAME:	Trailerworks, Inc.		000	· Once i	1411	.+.
-	JE - 111-21 TE	WATER OBSERVA	TINGS STREET	野馬, 有糖	CASING	SAMPLER TO	THEODE MADDELTS				+
-	and the same of	Depth 1	Stabilization Tane	TYPE:	N/A	4' Macro	N/A	Casing Elevation (t.)		-	-
440	AND 2012	Till 4 Alegen 1 (62)	diadelegacini fares	INSIDE DIAMETER	1,125*	in macro	100	PVC Elevation (ft.)		30 YOU	-
-	_			HAMMER WEIGHT	77,42			Surface Elevation (ft.)			-
			-	HAMMER FALC				Date Started	7/	28/00	-
7.				NOTES: 15 THE	Earth Probe			Date Completed		26/00	
报	(Sample)	Life Control of the	Penetration	Blows per 6*	and the same and	HEL CHELLISH	HATTI AND PERSONS	THE SELECTION OF S	Well As Built	Field	ME VE
th.	Number	Sample Depths	Recovery.	penetration	Strata Changes		Soil Descriptions		TOWN AS BUILD	Testing	No
1	-	0-2			1000	6" pavement; 6" mo				BOL	3
1					FINE SAND / SILT	gray/brown/black, v	er y sine owno and	, in the state of			
		2-4				damp, dark brown,	very fine SAND an	dSILT		BDL	
						WELL BURSTINGS			- 33		
		4-6'	1'			damp, brown, very	line SAND and SIL	ı		0.2	
	100					damp, brown/light to	mwn von fra CA	ND and SET with			
		6-8'	T.		FINE SAND / SILT	some CLAY	nown, very line SA	and our i with		BDL	-
11		///			SOME CLAY					-	
		8-10'		-	1	moist, brown/light brown, very fine, \$		ND and SILT with		BDL	-
						some CLAY	A.L. 12. F		23		
		10-12			FINE SAND / SILT	wet, gray, very fine	SAND and SILT			BDL	_
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-	Contraction of	Labino concessor	at total omanic	vancer TOWn Ired	erenced to a benzen	a standard maseur	od in the headenace	o of earland soil earns	nia fare with an h	inu kánda	PIO

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R	3	Environmen	al Compliance	Services, Inc.	SOIL BOR	NG and MONITORIN	IG WELL	BORING NO.	E	P-6	
Œ	- 1	P. 有可能型的约约	eal Agewam, Mas	THE RESERVE OF THE PARTY OF THE PARTY.		STALLATION LOG		SHEET TO A LOCAL	1	OF	1
A	1		44110 mm	CT TO SERVE	4 1260	1.43	*t	ALTHOUGH DECKE	LOCATION	15 15 154	
	made of the	Endonesia.	Constant C	and and the second	JOB NUMBER				LOCATION	_	
	The second second	Environmental 588 Silver Street	The second second	The second secon	PROJECT NAME	10007.00		1			
CORES	OR DESCRIPTION		100	430401030123	The state of the s	4 s E Minimisto Avenue	- W Cold	Son	Site P.	lan	322
_	T 401 II T 1 1 1	Nicholas Cardi	nair	-	THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.	115 Wayside Avenue	e, vv. Spio	366	Site P	Idii	
_		Karl Dietzler		-	CUENT NAME;	Trailerworks, Inc.	4.7	1 12 1	-	01.4	-
13	GROUND	WATER OBSERVA	rions	和知识的现在	CASING -	SAMPLIR	CORE BARREL				
	are -	Depth	Stabilization Time	TYPE + THE	N/A	4' Macro	N'A	Casing Elevation (ft.)			*
		0.000110.000000000000000000000000000000		NSIDE DIAMETER	1,125*			PVC Elevation (ft.)			
				HAMMER WEIGHT				Surface Elevation (ft.)			-111/11
				HAMMER FALL				Dute Started 1	7/2	8/00	200 70
784	J 10		S premers	NOTES.	Earth Probe			Date Completed	7/2	8/00	
epth	Sample	Sample Depths	Penatration	Blows per 6"	Strata Changes	Diffe (Carrie)	Soir Descriptions	<b>東京からは1979年</b>	Well As Built	Field	Notes
	Number.	- ASSESSMENT	Recovery	penetration :		問題無法		Carrier State (Se	到新年的其中位出	lesting	CHETTES!
0		0-2'			SAND	light brown, medium	fine SAND	1	,	BDL	1
					}	dark brown, fine SAI	ND.	1	1		
		2-4"				The state of			- 1	BDL	
				707		Service and the service and					100
4	5.17	4-6"	********			medium and fine SA	ND	120 20 1	l l	BDL	102000
	2 m 10 m						- 1980 E. P. Total		1		10000
		6-8"	000100000000000000000000000000000000000		SAND / SILT	light brown, medium	fine SAND and S	SILT		BOL	
								1			
8		8-10"	Contract of the last		SILT	fine, light gray SILT			Ì	BOL	107 30
	-	200			1			1	i		3,00
13	-	10-12	-	100		fine, light gray slit			1	BDL	
- 6	100				1			1	1		2
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. Fie	ld testino	values represer	nt total organic	vapors- TOVs (ref	erenced to a benzen	e standard) measures	in the headspar	e of sealed soil same	le jars with an Hr	u Mode	PID -
	or andarig		ills reported in						A STATE OF THE PARTY OF THE PAR		4

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a	2	Environmen	tal Compliance	Services, Inc.	SOIL BOR	NG and MONITOR	NG WELL -	DOCUMENT NO.		EP-7	
X		日本できたままなからおおき様を	eel, Agewam, Mas	1960年,1960年至1960年	- 0	STALLATION LOC	3	SHEET THE SHEET	4	CF	1
B		TENDER OF PERSON	Section 15 Lines	<b>经验证,工程的证据</b>	1	1,4 ,	1 2.4	TEST SERVED OF	1 LOCATION	The state of	1
250	nat revision	-	Service of						LOCATION	-	
		Environmental	A CANADA CONTRACTOR OF THE PARTY OF THE PART		JOB NUMBER	13997.00					
ORES	CHECKER	588 Silver Stre		assachusetts	PROJECT NAME: 11		10/200	Car	Cita D	Nam.	
	M. Julie	Nicholas Cardi	nati		PROJECT ADDRESS	The second secon	ue, W. Spfd	See	Site F	ran	
SINS	PECTOR:	Karl Dietzler			CUIENT NAME						
時	GROUND	WATER CHSERVA	TIONS	<b>建筑时间</b>	CASING THE	SAMPLER -	CORE BARREL "		200		
45	Dale	Depth	Stabilization Time	TYPE	N/A	4' Macro	N/A	Casing Elevation (fL)		1744	
				INSIDE DIAMETER	1.125		The second second	PVC Elevation (R.)			
	-		E Shirt S	HAMMER WEIGHT				Surface Elevation (ft.)			
				HAMMER FALL				Date Started 4.11	7/	28/00	
	-			NOTES: 11777	Earth Probe		-	Date Completed	7/	28/00	
100	Sample:	Trung Harris	Penetration/	( Blows per 6"	CONCRETE CONTROL	* otrobysovers.	ell'eller elle	TO STATE OF	Well As Built	Field:	No
pth	Number	Sample Depths		- penetration !	Shrata Changes	<b>二個監察</b>	Soil Descriptions		"Attended to the	Testing	NO
0		0-2'			SAND	light brown, fine SA	ND	- E3374 - 379 - 5		BDL	1
- 6			- 50/10 12	1.00		Cabibas a San Ci	NO	1			
	P. R. S. L. S.	2-4"		Market State		light brown, fine SA				BDL	
	111111111111111111111111111111111111111	100	Carrie Bayer								
4		4-6'	1		1	light brown, fine SA	ND			BOL	
					1						
		6-8'			SILT	light brown, fine sa	nd, last 2" SILT			BDL	
								50			-
8		8-10"	7.00		1	light gray SILT		1		BDL	1
					0	rynt gray oit.					1
		10-12'	-	-		wet, light gray SILT	to medium/fine SA	ND: last 2" fine		BDL	1 2
		10-12			SAND	SAND	to moduli mic ci	ALIGNA MICH.		DUL	-
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-	old Instinct	unhung coases	of total crearie	unnom. TON/e /e-	ferenced to a benzen	e standard) measure	ad in the bredess	a of sociad sell ser	ale fore with se to	inu Mada	N PIC
TO I	ignization	Detector, Res	ills reported in	parts per million (	ppm). Detection Lim	is - 0.2 non. RDI =	Below Detection I	o or seared son sam imits.	projeta with an P	HILL MODE	AFID
-		1.00	A CAMPAGE TO THE					100000000000000000000000000000000000000			

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	7		THE P. A.	N. West				BORING NO: 1955	E	P-8	
	يكمر	AND SHALL SEED OF SHALL SEED	SERVICE STREET	Services, Inc.	SOIL BORI	NG and MONITORI	NG WELL	DOCUMENT NO.: 5		H. Marily	
		588 Silver St	eet Agewatt, Mas	sechusette 01001	2 m			SHEET TE · 对级	1	OF	1
HT ME	SERVICE OF	持續和可能認用	<b>自由</b>	-174 M25 Balo.		1700			LOCATION	****	
		Environmental			JOB NUNSER: MAN	13997.00					
CRING	COMPANY	588 Silver Stre	et, Agawam, M	lassachusetts	PROJECT NAME:				014. 0	Y	A
OREMA	W. S.	Nicholas Cardi	nali		PROJECT ADDRESS:	115 Wayside Avenu	ue, W. Spfd	See	Site P	ian	
CS INS	PECTOR	Karl Dietzler			CLENT NAME	Trailerworks, Inc.			40		19
14.7	GROUND	WATER OBSERVA	TIONS	<b>元代的特殊</b>	CASING TO	SAMPLER	CORE BARREL				
1.35	Date	Depth	Stabilization Time	TYPE CONSTITUTE	N/A	4" Macro	N/A	Casing Elevation (N.)			
				INSIDE DIAMETER	1.126*			PVC Elevation (ft.)			
				HAMMER WEIGHT		Section 1	7140-7-1-11	Surface Elevation (fl.)			
				HAMMER FALLICE				Oute Staned	76	00/85	
	Section 1	- 1		NOTES:	Earth Probe			Date Completed	77	00/85	O I I STATE
- Ment	(Sample)	Sample Depths	Penetration	- Blows per 6"	Strata Changes	sample intringer	So Descriptions		Well As Suit	Field	Notes
Depth	Number	Sample Depths	Recovery "	penetration	Card State Committee of the Committee of				NO. OF PERSONS AND PROPERTY.	Testing	1000年の中心
0		0-2"			SAND	tight brown, fine SA	ND			BDL	1
						light brown, fine SA	ND				
		2-4'	100000000000000000000000000000000000000			Jan 2. com, time on	2007			BDL	
					1			ý.			
4	2200	4-6'				light brown, mediun	n/fine SAND			BDL	
	12.13	-					1			3000	
	ence !	6-8'			SILT	fine SILT				BOL	
8										St. 1	Samo
8		8-10"	-	1		fine SILT				BOL	E
1 1		000000000000000000000000000000000000000					22.0		1 6	44.35	
	i i	10-12			100	moist, light gray Sit	T			BDL	2
1 3					1			9	1		
12	S		Carrier State		1						
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1 19						7-10-10-10-10-10-10-10-10-10-10-10-10-10-	2 2/10/20		20 9	Silver I	
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1 5	old bassing	values recent	of total organic	vacors TOWs (rel	erenced to a heaven	e slandard) monture	od in the headense	e of sealed soil samp	le lars with an H	nu Mode	PID-
	Filecon min						Below Detection L		in just mer ail it		

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4	3	rakilan	146645.57	· 松市籍2.5	T	- VIII	BORING NO. HIE		P-9		
6	-10	Environmen	tal Compliance	Services, Inc.	SOIL BOR	ING and MONITORIN	NG WELL	DOCUMENT NO.			ALC: MARKET
ST.	100	WESTER CHARLESTON PARTY	\$1.00 mm 1	sachusetta 01001				SHEET IS THE P	1	OF	1
. 4	3	是是法院的特別		一品献と紹介の中	35 × 5.	NSTALLATION LOG	Charles .	-St. Million Phops	LOCATION	41.50	-
BOOMS	CONDING	Environmental		THE RESERVE TO SERVE	JOB NUMBER:		100		LOUNTION		
<b>BORING</b>	COMPANY	588 Silver Stre	A STATE OF THE PARTY OF THE PAR	- American Company	PROJECT NAME			1000	G		
FOREMA	NE .	Nicholas Cardi	- Contracting to the Contracting		1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	115 Wayside Avenu	e, W. Sold	Sec	Site P	lan	
15/7/02	PECTOR:	Karl Dietzler		-	CLIENT NAME	Trailerworks, Inc.			· Onco		(4)
1 - 1 - 1 - 1	the same of	WATER COSERVA	TICARS THE SECOND	"起"	CASING 711	SAMPLER	CORE BARREL				
13/3	CONTRACTOR OF THE PARTY OF	Depth T	Stabilization Time	TYPE - 1	N/A	4' Macro	N/A	Casing Elevation (R.)		_	
10.00	Date &	Depth Depth	State (State) Lime	INSIDE DIAMETER	1,125*	4 maulu	-10	PVC Elevation (fL)		-	
7,70	-		-	HAMMER WEIGHT	1.143	-		Surface Elevation (ft.)		*	
2	_	-		HAMMER FALL		-		Date Started	7/	28/00	
-	110003				Earth Probe	l		The same of the sa		28/00	
1024	Sample*	a facultication of the	Penetration	NOTES:	1 (11)	Company and a service of	ACTIVATED FOR THE PARTY.	Date Completed		0110.00	ALCOST
Depth	Number	Sample Depths	Recovery	penetration	Strata Changes		Soil Descriptions 1		- Well As Boilt	Field Testing	Notes
0		0-2'			SAND	dark brown, fine/med	dium SAND			30	1
						light brown SILT			3		
1		2-4'			SILT	iight brown SiL1				170	
1				American India		con Here					1000000
4		4-6'				light brown SILT				10	
			Same of			1	1			1 200	
		6-8"			1	light gray SILT				130	
					1					1	
8		B-10°	1000 00		SAND	light gray medium/fir	ne SAND			130	
		10-12'				light brown, medium	Vine SAND			30	
9			70	Same Comm	1						
12		12-14'			1	medium/fine SAND				160	
1				-	1						
		14-16"	-		1	moist, medium/fine 5	SAND			BDL	2
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<sup>1.</sup> Field testing values represent total organic vapors- TCVs (referenced to a benzene standard) measured in the headspace of sealed soil sample lars with an Hnu Model PID - Photoionization Detector. Results reported in parts per million (ppm). Detection Limits - 0.2 ppm. BDL = Below Detector Limits.

Groundwater encountered at approximately 14 feet below grade.

# ATTACHMENT V Groundwater Sampling Log

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### Environmental Compliance Services, Inc. 588 Säver Streat, Agawam, Massachusetta 01001 MA: (413) 789-3530 FAX: (413) 789-2776

Sar 71 (min nch Dia C	mple 1	TEMP.		4 mc	,									
mich Dia C	lma D		Section of the last				, 3	Weather Co	nditions:	Ph.	y Usu.	ly-	bomil	MW
1 4		Degrees Celsius)	pH s,	Specific Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	mV millvolts	Orawdown <0.3 feet	Depth	Depth of Well	Standing Water	Alicate of Saturated Zone (feet)	State Volume	Minimum Purge Volume	
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1 8	5,0 j	5.4	6.46	634	2.04	-74								
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the second second	1.0	5.1	6.16	632	2.62	-73								
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### Environmental Compliance Services, Inc. 568 Silver Steet, Agawam, Massachusetts 01001 MA: (413) 769-3530 FAX: (413) 769-2776

	Sample Time (minutes)	TEMP. Degrees (Celsius)	pH ₽.	Specific Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	- mV millyolts	Drawdown <0.3 feet	Depth to Water PVC/RIM	7/25 anditions: Depth of Well PVC/RIM	Standing Water (feet)	Aricale of Saturated Zone (feet)	Static Volume (gallons)	Klinimum Pursi Volume (gations)	Observation
	ia.Casing	Princer II						16-0	25.95	7.95		- 6	5	
		7 10												
	2.0	160	709	271	5.77	-46								
	4.0	15.6		255	6.78	-46						1000		
					7.03	-46								
	8.0	15.4	6.82	225	7.24	-46								
	10.0	15,1	6.53	223	7.26	-46		110						
	12.0	15.0	6.35	220	7.26	-46		1770.5						
	14.0	148	6.03	215	7.23	-46				10.11				
(8)	16.0	14.7	5.98	214	7,32	-46		200						12 2
-	18.0	148	6.09	214	7.15	-45		-					-	10
	20.0		5.85	211	7.21	-45	-							
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_		14.6		211	17/13				-	-	-		-	
	260	17.6	5.78	213	7.17	-45			-	-	-	-	-	
	28.0	14.6	2.18	2/3	717	-45		-	-	-		_		
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### Environmental Compliance Services, Inc. 588 Silver Street, Agamam, Massachusens 0:001 MA: (413) 789-3500 FAX: (413) 789-2778

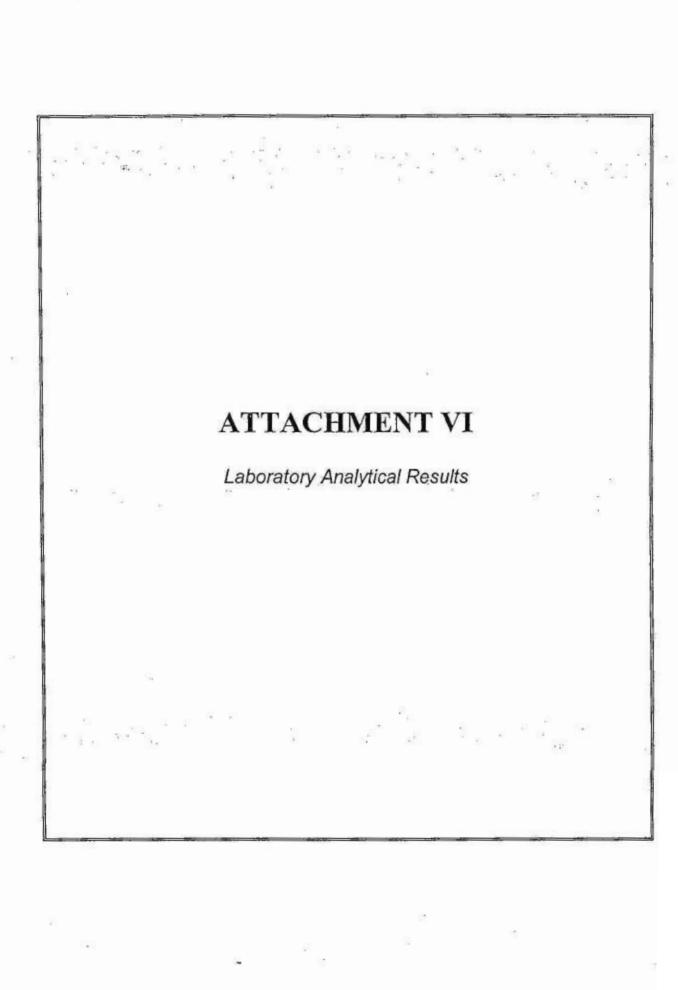
lient:	ation: 115 Wayside Ave J W. SpHa						Job Numbe	e;	-				WELL I.D	
ocation	115	Way	side 1	Ave 1	W. Spf	ld		Date:	7/2	4/0		1.4		mw-3
ersonne	1: 1-1	10 1					e e	Weather Co	inditions:	Usa	dy /	Munic	6 80'S	
-	Sample	TEMP.	pH [	Specific	Dissolved	, mV	Orawdown		Depth	Standing	Alicale of	State	Minimum	
10	Time	Degrees	21,	Conductivity	Oxygen	mavelts	<0.3 feet	ta Water	of Welt	Water	Saturated	Volume	Purge Volume	Observation
	(minutes)	(Ceislus)		(uS/cm)	(mg/L)	Sit	**-	PVC/RIM	. PVC/RIM	(feat)	Zone (fact)			
2 Inch C	Dia Casing		7	1000		341	4	17.48	28.75	11.27	5.63		6 get	
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			6.32			-75		-	-	-	-	-		-
	17.0	13.1	6.04	572	3.20	75	-		-	-				
-			5,99	579	3.22	-75			-	1		-		
	18.0	15.1	5.97	574	3.27	-76			1			3-37		
-	20,0	15.0	5.96	5.76	3.30	-76						1		
	22.0	15.0	5.96	576	3.30	-76								
545	24.0	15.0	5.96	576	3.30	-76	1	2000			2000	100		( 100 mm)
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Environmental Compliance Services, Inc. 588 Silver Street, Against Massachusetts 01001 MA: (413) 789-3530 FAX: (413) 769-2776

tion: tion: onnel	115 KN	Ways	ile A	ve/w	Sola			Job Number Date: Wealher Co	r. Flanditions:	24/0	142	hum	d	MELL I.C
T	Sample Time	TEMP. Degrees (Celsius)	- pH ø,	Specific Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	mV milivolts	Drawdown <0.3 feet	Depth to Water PVC/RIM	Depth of Well PVC/RIM	Standing Water (feet)	Micole of Saturated Zone (feet)	State Volume (gallons)	Alinimum Purge Volume (galfons)	Observation
_	a.Casing			. 100 000	1-9-1			15.85	23.00			13.	Ugal	-
				Lesson was			1		12 13					
	20	15,9	6.15	858	4.24	-85			2-2					
	4.0	15.1	6.16	854	4.14	-54	12							
	6.0	14.8	6.16	842	4,30	- 54					1			
25	8.0	14.6	6.16	824	4.32	-54								
-	10.0	14.5	6.15	809	4.38							332		
-4	12.0	14.5		810	4.37	-54								
_ ]	14.0	1115	6.14	805	4.41	-54						7		
	16.0	14.4	6,14	732	4.72			7.00						
	18.0	14.3	6.15	669	4.94	-54								
9	26,3	14.3	6.15	655	4.95	-54								
	22.0	14.3	6.12	646	4.99	-54								
	24.0	11.2	6.10		4.97	-54								
	26.0	14. 2	6.10	629	5.05	-54						150		
7	28.0	14.2	6.10	676	4.97	-54			100					
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## SPECTRUM ANALYTICAL, INC.

### Featuring

### HANIBAL TECHNOLOGY

Massachusetts Certification # M-MA138
Rhode Island # 98 Maine # MA138
Florida # E87600 / 87562
New Hampshire # 2538
Connecticut # PH-0777
New York # 11393

ECS, Inc.

588 Silver Street

AB99089

Agawam, MA 01001

Attn: Mark A. Haynes

Client Project Number: 13997

8/4/00

Location: 115 Wayside Ave-W. Spfld, MA

Company of the second s		
Client Sample ID		Analyses Requested
EP-9 12-14'		Ultrasonic Extraction
		EPH Aliphatics/Aromatics
		EPH Target PAH Analytes
		VOC Extraction (solid)
	102	VPH Aliphatics/Aromatics
		VPH Target Analytes

AB99090

EP-2 6-8'

% Solids
Ultrasonic Extraction
EPH Aliphatics/Aromatics
EPH Target PAH Analytes
VOC Extraction (solid)
VPH Aliphatics/Aromatics
VPH Target Analytes
% Solids

AB99091

Ep-4 2-4'

Ultrasonic Extraction EPH Aliphatics/Aromatics

EPH Target PAH Analytes VOC Extraction (solid)

VPH Aliphatics/Aromatics VPH Target Analytes

% Solids



### SPECTRUM ANALYTICAL, INC. Featuring

HANIBAL TECHNOLOGY

Client Project Number: 13997

Location: 115 Wayside Ave-W. Spfld, MA

Laboratory ID

Client Sample ID

Analyses Requested

I attest that all information contained within this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method including any data obtained from a subcontract laboratory.

Hanibal C. Taxeh

President/Laboratory Director

# SPECTRUM ANALYTICAL, INC.

Laboratory Report

Location: 115 Wayside Ave-W. Spfld, MA

Client: ECS

Lab ID No: AB99089

Client Id: EP-9 12-14'

Client Project No: 13997

Submittal Date: 7/28/00

Collection Date: 7/28/00

Parameter 	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
VOC Preparation							
VOC Extraction (solid)	Field ext		82	7/28/00	7/28/00		SW846 5035
Volatile Organic Compounds VPH Aliphatics/Aromatics				FE2	×		
C5-C8 Aliphatic Hydrocarbons	36	mg/Kg	10.7	8/3/00	8/3/00	RLJ	MA VPH 97-1
C9-C12 Aliphatic Hydrocarbons	39	mg/Kg	3.58	8/3/00	8/3/00	RLJ	MA VPH 97-1
C9-C10 Aromatic Hydrocarbons	100	mg/Kg	3.58	8/3/00	8/3/00	RLJ	MA VPH 97-1
Unadjusted C5-C8 Aliphatics	56	mg/Kg	10.7	8/3/00	8/3/00	RLJ	MA VPH 97-1
Unadjusted C9-C12 Aliphatics	139	mg/Kg	3.58	8/3/00	8/3/00	RLJ	MA VPH 97-1
Carbon Chain Dilution Factor	1,000	mg/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-1
VPH Target Analytes							
Benzene	Not detected	ug/Kg	720	8/3/00	8/3/00	RLJ	MA VPH 97-1
Toluene	Not detected	ug/Kg	720	8/3/00	8/3/00	RLJ	MA VPH 97-1
Ethylbenzene	3,800	ug/Kg	720	8/3/00	8/3/00	RLJ	MA VPH 97-1
m,p-Xylenes	10,600	ug/Kg	1400	8/3/00	8/3/00	RLJ	MA VPH 97-1
o-Xylene	5,400	ug/Kg	720	8/3/00	8/3/00	RLJ	MA VPH 97-1
Naphthalene	7,600	ug/Kg	720	8/3/00	8/3/00	RLJ	MA VPH 97-1
Methyl-tert-butyl ether (MTBE)	Not detected	ug/Kg	720	8/3/00	8/3/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) PID	84	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) PID 2,5-Dibromotoluene (%SR) FID	76	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-1
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-1
Target Analytes Dilution Factor	1,000	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-1
TPH Preparation	58 111						
Ultrasonic Extraction	Completed	. 19	12	8/3/00	8/3/00	RT	SW846 3550E
Petroleum Hydrocarbon Analysis EPH Aliphatics/Aromatics			500 K			*	
C9-C18 Aliphatic Hydrocarbons	Not detected	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Not detected	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Not detected	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Not detected	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-
Carbon Chain Dilution Factor	1	mg/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-
EPH Target PAH Analytes							
Naphthalene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
2-Methylnaphthalene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-
Acenaphthylene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-

Lab ID No: AB99089 Client Id: EP-9 12-14' Collection Date: 7/28/00

Parameter .	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
cenaphthene	Not detected	ug/Kg .	150	8/3/00	8/3/00	-LR	MA EPH 98-1
Fluorene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
ACCOUNTY TO THE PARTY OF THE PA	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Anthracene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Fluoranthene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
yrene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) anthracene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
- Cin yserie	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (b) fluoranthene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (k) fluoranthene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) pyrene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (g,h,i) perylene 1-Chloro-octadecane Aliphatic (%SR)	Not detected	ug/Kg	150	8/3/00	8/3/00	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	81	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Ortho-Temberry Aromatic (%SD)	56	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	93	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	94	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Target Analyte Dilution Factor	1 .	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
% Solids	91.2	%		8/3/00	8/3/00	RT	SM2540 B Mod

Lab ID No: AB99090 Client Id: EP-2 6-8' Collection Date: 7/25/00

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
OC Preparation						£0	
VOC Extraction (solid)	Field ext	¥ , p		7/25/00	7/25/00		SW846 5035
olatile Organic Compounds PH Aliphatics/Aromatics	5 1	20 10		59	1 -		
C5-C8 Aliphatic Hydrocarbons	108	mg/Kg	12.0	8/3/00	8/3/00	RLJ	MA VPH 97-1
C9-C12 Aliphatic Hydrocarbons	386	mg/Kg	4.01	8/3/00	8/3/00	RLJ	MA VPH 97-1
69-C10 Aromatic Hydrocarbons	520	mg/Kg	4.01	8/3/00	8/3/00	RLJ	MA VPH 97-1
Unadjusted C5-C8 Aliphatics	184	mg/Kg	12.0	8/3/00	8/3/00	RLJ	MA VPH 97-12
Jnadjusted C9-C12 Aliphatics	906	mg/Kg	4.01	8/3/00	8/3/00	RLJ	MA VPH 97-1
Carbon Chain Dilution Factor	1,000	mg/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-1
VPH Target Analytes							
Benzene	Not detected	ug/Kg	800	8/3/00	8/3/00	RLJ	MA VPH 97-12
Toluene	Not detected	ug/Kg	800	8/3/00	8/3/00	RLJ	MA VPH 97-12
Ethylbenzene	14,400	ug/Kg	800	8/3/00	8/3/00	RLJ	MA VPH 97-12
m,p-Xylenes	41,600	ug/Kg	1600	8/3/00	8/3/00	RLJ	MA VPH 97-12
o-Xylene	20,000	ug/Kg	800	8/3/00	8/3/00	RLJ	MA VPH 97-12
Naphthalene Methyl-tert-butyl ether (MTBE)	48,000	ug/Kg	800	8/3/00	8/3/00	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Not detected	ug/Kg	800	8/3/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	74	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	81	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
	NA	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS Target Analytes Dilution Factor	1,000	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-12
TPH Preparation							
Ultrasonic Extraction	Completed		20	8/1/00	8/1/00	DD	SW846 3550B
Petroleum Hydrocarbon Analysis EPH Aliphatics/Aromatics	Companie			0.1700	0.1700	22	511011022302
C9-C18 Aliphatic Hydrocarbons	1,300	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	250	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	1,299	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	1,367	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	8/3/00	8/3/00	LR .	MA EPH 98-1
EPH Target PAH Analytes							
Naphthalene	27,000	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
2-Methylnaphthalene	37,000	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthylene	380	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthene	370	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Fluorene	800	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Phenanthrene	2,000	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Anthracene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Fluoranthene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Pyrene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-

Lab ID No: AB99090 Client Id: EP-2 6-8' Collection Date: 7/25/00

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Benzo (a) anthracene	Not detected	ug/Kg	160	8/3/00	8/3/00	· LR	MA EPH 98-1
Chrysene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (b) fluoranthene	Not detected .	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (b) fluoranthene Benzo (k) fluoranthene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) pyrene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Not detected	ug/Kg	160	8/3/00	8/3/00	I.R	MA EPH 98-1
Benzo (g,h,i) perylene 1-Chloro-octadecane Aliphatic (%SR)	84	ug/Kg	- 0.	8/3/00	8/3/00	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	96	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	97	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR) 2-Fluorobiphenyl Fractionation (%SR)	103	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
% Solids	85.1	%		8/1/00	8/1/00	DD	SM2540 B Mod

Lab ID No: AB99091 Client Id: EP-4 2-4' Collection Date: 7/25/00

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
VOC Preparation			Limit			47	
VOC Extraction (solid)	Field ext	6		7/25/00	7/25/00	No.	SW846 5035
Volatile Organic Compounds VPH Aliphatics/Aromatics	1,	*	+ 1	1 4 4		113	
C5-C8 Aliphatic Hydrocarbons	Not detected	mg/Kg	3.39	8/3/00	8/3/00	RLJ	MA VPH 97-1
C9-C12 Aliphatic Hydrocarbons	26	mg/Kg	1.13	8/3/00	8/3/00	RLJ	MA VPH 97-1
C9-C12 Aliphatic Hydrocarbons C9-C10 Aromatic Hydrocarbons	39	mg/Kg	1.13	8/3/00	8/3/00	RLJ	MA VPH 97-1
Unadjusted C5-C8 Aliphatics	Not detected	mg/Kg	3.39	8/3/00	8/3/00	RLJ	MA VPH 97-1
Unadjusted C9-C12 Aliphatics	65	mg/Kg	1.13	8/3/00	8/3/00	RLJ	MA VPH 97-1
Carbon Chain Dilution Factor	250	mg/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-1
VPH Target Analytes							
VPH Target Analytes Benzene	Not detected	ug/Kg	230	8/3/00	8/3/00	RLJ	MA VPH 97-1
Toluene	Not detected	ug/Kg	230	8/3/00	8/3/00	RLJ	MA VPH 97-1
Ethylbenzene m.p-Xvlenes	Not detected	ug/Kg	230	8/3/00	8/3/00	RLJ	MA VPH 97-1
m,p-Xylenes	Not detected	ug/Kg	450	8/3/00	8/3/00	RLJ	MA VPH 97-1
o-Xylene	Not detected	ug/Kg	230	8/3/00	8/3/00	RLJ	MA VPH 97-1
Naphthalene	4,900	ug/Kg	230	8/3/00	8/3/00	RLJ	MA VPH 97-1
Methyl-tert-butyl ether (MTBE)	Not detected	ug/Kg	230	8/3/00	8/3/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) PID	78	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) FID	88	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-1
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-1
Target Analytes Dilution Factor	250	ug/Kg	0.	8/3/00	8/3/00	RLJ	MA VPH 97-1
TPH Preparation							
Ultrasonic Extraction	Completed			8/1/00	8/1/00	DD	SW846 3550E
Petroleum Hydrocarbon Analysis EPH Aliphatics/Aromatics							
C9-C18 Aliphatic Hydrocarbons	Not detected	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	39	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Not detected	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Not detected	mg/Kg	30	8/3/00	8/3/00	LR	MA EPH 98-
Carbon Chain Dilution Factor	1	mg/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
EPH Target PAH Analytes							
Naphthalene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
2-Methylnaphthalene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthylene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Fluorene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
Phenanthrene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-
Anthracene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-
Fluoranthene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-
Pyrene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1

Lab ID No: AB99091 Client Id: EP-4 2-4' Collection Date: 7/25/00

9	Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
I	Benzo (a) anthracene	Not detected	ug/Kg	160	8/3/00	8/3/00	· LR	MA EPH 98-1
	Chrysene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
H	Benzo (b) fluoranthene	Not detected	ug/Kg	160	8/3/00	8/3/00	- LR	MA EPH 98-1
	Benzo (b) fluoranthene Benzo (k) fluoranthene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR ·	MA EPH 98-1
	Benzo (a) pyrene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
u	Indeno (1,2,3-cd) pyrene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
	Dibenzo (a,h) anthracene	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
han	Dibenzo (a,h) anthracene Benzo (g,h,i) perylene 1-Chloro-octadecane Aliphatic (%SR)	Not detected	ug/Kg	160	8/3/00	8/3/00	LR	MA EPH 98-1
	1-Chloro-octadecane Aliphatic (%SR)	113	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
· CILL	Ortho-Terphenyl Aromatic (%SR)	115	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
	2-Bromonaphthalene Fractionation (%SR)	78	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
	2-Fluorobiphenyl Fractionation (%SR)	77	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
	Target Analyte Dilution Factor	1	ug/Kg	0.	8/3/00	8/3/00	LR	MA EPH 98-1
u	% Solids	79.6	%		8/1/00	8/1/00	DD	SM2540 B Mod

Lab ID No: AB99091 Client Id: EP-4 2-4' Collection Date: 7/25/00

ameter		Results	Units Reporting Limit	Start Date	End Date	Analyst	Meth		
The following or	utlines the con	dition of all EPH samp	les contained within this r	eport upon labo	oratory receip	pt.			
Matrix	☐ Aqueous	Soil Sedime	nt Other:		71 8 12				
Containers	☐ Satisfacte	ory Broken DI	eaking	10, 100 10					
Aqueous Prese	rvative	N/A □ pH≤2 □	pH>2 pH adjusted to	≤2 in lab C	Comment:	07 00			
Temperature	☐ Received	on ice Received	cold Received ambie	nt 🗆 Receiv	ed with temp	blank:			
-			oles contained within this i	eport upon lab	oratory recei	pt.			
Matrix	Aqueous		ent Other:				-		
Containers	Satisfact						_		
	Aqueous		A □ pH≤2 □ pH>2 Comment:  A □ Samples NOT received in Methanol or air-tight container						
Sample Preservative	Soil or		nl Methanol/g						
	Sediment		in Methanol covering soil	not cover		1:1 +/- 25% Other:   : 7			
		Sample received in	The second secon						
Temperature	☐ Received	d on ice	cold Received ambie	nt L Receiv	ed with temp	blank:			
Were any signification where all QA/QC Were any signification where all perform Yes, if PID and FIE Sample(s) was run	procedures for cant modificat ance/acceptan surrogate recover a via GCMS using	ions made to the VPH noted by the construction of the EPH noted standards for require the cries are listed as n/a, then the gall QC criteria specified in		No No tion 11.3? Yes ieved? Yes ng all QC criteria	No No specified in the	method.			
	d in this repo	(F) (F) (1) (1) (1) (1) (1)	s immediately responsible nowledge and belief, accur Validateaby		and are all some	n, the	15		
		Assurance Depts.		DULaboratory)	Director	. 8/	/4/00		



# SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

# Laboratory Report Supplement <u>References</u>

SW 846	Test Methods for Evaluating Solid Waste. Third edition, 1998
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act
40 CFR 141	National Primary Drinking Water Regulations
40 CFR 143	National Secondary Drinking Water Regulations
40 CFR 160	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Good Laboratory Practice Standards
_APHA-AWWA-WPCF	Standard Methods for the Examination of Water and Wastewater. 19th edition, 1995
ASTM D 3328	Standard Methods for the Comparison of Waterborne Petroleum Oils by Gas Chromatography
EPA 540/G-87/003	Data Quality Objectives for Remediation Response Activities, Development Process
MEPA 600/4-79-012	Quality Assurance Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-012 EPA 600/4-79-019	Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-020	Method for the Chemical Analysis of Water and Wastes
EPA 600/4-82-057	Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater
EPA 600/4-85/056	Choosing Cost-Effective QA/QC Programs for Chemical Analysis
EPA 600/4-88/039	Method for the Determination of Organic Compounds in Drinking Water
EPA 600/4-88/039 CT ETPH	Analysis of Extractable Total Petroleum Hydrocarbons (ETPH)
_ MADEP EPH	Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)
MADEP VPH	Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)
QAMS 004/80	Guidelines and Specifications for Preparing Quality Assurance Program Plans, USEPA Office of Monitoring System and Quality Assurance
.GC-D-52-77	Oil Spill Identification System

### Acronyms & Abbreviations

AA	Atomic Absorption		MS	Matrix Spike
ASTM	American Society for Testing and Materials		MSD	Matrix Spike Duplicate
BOD	Biological Oxygen Demand		NTU	Nephelometric Turbidity Units
°C'	degree(s) Celsius		<b>PAHs</b>	Polynuclear Aromatic Hydrocarbons
COD	Chemical Oxygen Demand		PCBs	Polychlorinated Biphenyls
CMR	Code of Massachusetts Regulations		PID	Photo Ionization Detector
DEP	Department of Environmental Protection		PQL	Practical Quantitation Limit
DI	De-ionized		R	Recovery (%R: Percent Recovery)
DO	Dissolved Oxygen		RSD	Relative Standard Deviation
EPA	Environmental Protection Agency		SM	Standard Method
EPH	Extractable Petroleum Hydrocarbons		SR	Surrogate Recovery (%SR)
FID	Flame Ionization Detector		SW	Solid Waste
GC	Gas Chromatograph		THM	Trihalomethane(s)
GC/MS	Gas Chromatograph / Mass Spectrometer		TOC	Total Organic Carbon
ICP	Inductively Coupled Plasma		TOX	Total Organic Halogen
Id	Identification		TPH	Total Petroleum Hydrocarbons
MCL	Maximum Contaminant Level -	+	VOC	Volatile Organic Compound
MDL	Minimum Detection Limit		VPH	Volatile Petroleum Hydrocarbons



Featuring HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Page / of

Special Handling:

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☐ Standard TAT - 7 to 10 business days TKush TAT - Date Needed: 8/4/00

All TATs are subject to laboratory approval.

Min. 24-hour notification is needed for rushes.

· All samples are disposed of after 60 days.

unless otherwise instructed.

State: Mt Notes: Date: Waysing Project No.: 13597 Received By: Analyses: Location: L Sampler(s): Site Name: Hd3 X X HUM Containers: # of Plastic # of Clear Glass RON: Relinquished By; # of Amber Glass 3 # of VOA Visls N 4 Préservative 4 4 20 35 6=Ascorbic Acid 3 Invoice To: Lype 0 9 0 P.O. No.: SO=Soil SL=Sludge O=Oil A=Air WW=Wastewater 3 pm Time: 10 Am 2 Pm S=N:iOH C=Composite 4=HNO. 7/28/00 7/25/10 GW=Groundwater co-268" 7/25/20 Date: C E-mail results when available to □ Fax results when available to (. 3=H,SO4 H-1 5-B 1690 100-4 2-4 LAN X2= Sample Id: G=Grab 8=NaHSO Additional Instructions: DW<sub>∓</sub>Drinking Water 2=HCI SW= Surface Water Project Mgr.: A GOOD INUS,O, AB ... AB AB Report To: 7=CH,OH Lab Id:

11 Almgren Drive • Agawam, Massachusetts 01001 • 413-789-9018 • Fax 413-789-4076 • www.spectrum-analytical.com



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### HANIBAL TECHNOLOGY

Massachusetts Certification # M-MA138 Rhode Island # 98 Maine # MA138 Florida # E87600 / 87562 New Hampshire # 2538 Connecticut # PH-0777 New York # 11393

ECS, Inc.

588 Silver Street

Agawam, MA 01001

Attn: Mark A. Haynes

Client Project Number: 13997

8/8/00

Location: Commercial Disposal Co-MA

Laboratory ID	Client Sample ID	Analyses Requested
AB98610	MW-1	VPH Aliphatics/Aromatics VPH Target Analytes Separatory Funnel Extraction
AB98611	MW-2	EPH Aliphatics/Aromatics EPH Target PAH Analytes VPH Aliphatics/Aromatics VPH Target Analytes Separatory Funnel Extraction
AB98612	MW-3	EPH Aliphatics/Aromatics EPH Target PAH Analytes VPH Aliphatics/Aromatics VPH Target Analytes Separatory Funnel Extraction
AB98613	MW-4	EPH Aliphatics/Aromatics EPH Target PAH Analytes VPH Aliphatics/Aromatics VPH Target Analytes Separatory Funnel Extraction EPH Aliphatics/Aromatics
AB98614	Trip	EPH Target PAH Analytes  VPH Aliphatics/Aromatics  VPH Target Analytes



### SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

Client Project Number:

13997

Location: Commercial Disposal Co-MA

Laboratory ID

Client Sample 1D

Analyses Requested

I attest that all information contained within this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method including any data obtained from a subcontract laboratory.

1 V/1

President/Laboratory Director

# SPECTRUM ANALYTICAL, INC.

Laboratory Report

Location: Commercial Disposal Co-MA

Client: ECS

Lab ID No: AB98610 Client Id: MW-1 Collection Date: 7/24/00 Matrix: Ground Water

Client Project No: 13997 Submittal Date: 7/24/00

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds VPH Aliphatics/Aromatics						10	
C5-C8 Aliphatic Hydrocarbons	Not detected	mg/L	0.075	8/2/00	8/3/00	RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/3/00	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/3/00	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Not detected	mg/L	0.075	8/2/00	8/3/00	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Not detected	mg/L	0.025	8/2/00	8/3/00	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	1	mg/L	0.	8/2/00	8/3/00	RLJ	MA VPH 97-12
VPH Target Analytes							
Benzene	Not detected	ug/L	5.0	8/2/00	8/3/00	RLJ	MA VPH 97-12
Toluene	Not detected	ug/L	5.0	8/2/00	8/3/00	RLJ	MA VPH 97-12
Ethylbenzene	Not detected	ug/L	5.0	8/2/00	8/3/00	RLJ	MA VPH 97-12
m,p-Xylenes	Not detected	ug/L	10	8/2/00	8/3/00	RLJ	MA VPH 97-12
o-Xylene	Not detected	ug/L	5.0	8/2/00	8/3/00	RLJ .	MA VPH 97-12
Naphthalene	Not detected	ug/L	5.0	8/2/00	8/3/00	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Not detected	ug/L	5.0	8/2/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	99	ug/L	0.	8/2/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	108	ug/L	0.	8/2/00	8/3/00	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/3/00	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/3/00	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	1	ug/L	0.	8/2/00	8/3/00	RLJ	MA VPH 97-12
TPH Preparation							
Separatory Funnel Extraction	Completed			7/27/00	7/27/00	AP	SW846 3510C
Petroleum Hydrocarbon Analysis EPH Aliphatics/Aromatics							
C9-C18 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR.	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Not detected .	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/L		8/3/00	8/3/00	LR	MA EPH 98-1
EPH Target PAH Analytes							
Naphthalene	Not detected	ug/L	5.0 ~	8/3/00	8/3/00	LR	MA EPH 98-1
2-Methylnaphthalene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthylene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Fluorene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1

Lab ID No: AB98610 Client Id: MW-1

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Phenanthrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Fluoranthene	Not detected	ug/L	5.0	. 8/3/00	8/3/00	LR.	MA EPH 98-1
Pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Chrysene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (b) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (k) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	70	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	75	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	86	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	87	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1

Lab ID No: AB98611 Client Id: MW-2

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds VPH Aliphatics/Aromatics						2	
C5-C8 Aliphatic Hydrocarbons	Not detected	mg/L	. 0.075	8/2/00	8/2/00	RLJ .	MA VPH 97-1:
09-C12 Aliphatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-1
C9-C10 Aromatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-1
Unadjusted C5-C8 Aliphatics	Not detected	mg/L	0.075	8/2/00	8/2/00	RLJ	MA VPH 97-1
Jnadjusted C9-C12 Aliphatics	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-1
Carbon Chain Dilution Factor	1	mg/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
VPH Target Analytes							
Benzene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
Toluene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-12
Ethylbenzene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
n,p-Xylenes	Not detected	ug/L	10	8/2/00	8/2/00	RLJ	MA VPH 97-1
o-Xylene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
Naphthalene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
Methyl-tert-butyl ether (MTBE)	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) PID	89	ug/L	0,	8/2/00	8/2/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) FID	80	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
4-Bromofluorobenzene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
Target Analytes Dilution Factor	1	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
TPH Preparation							
Separatory Funnel Extraction	Completed			7/27/00	7/27/00	AP	SW846 3510C
Petroleum Hydrocarbon Analysis EPH Aliphatics/Aromatics					<u> </u>		
C9-C18 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-
Unadjusted C11-C22 Aromatics	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/L		8/3/00	8/3/00	LR	MA EPH 98-1
EPH Target PAH Analytes	1			T			
Naphthalene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
2-Methylnaphthalene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthylene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Fluorene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Phenanthrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Chrysene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1

Lab ID No: AB98611 Client Id: MW-2

			0.0 201001274				
Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Benzo (b) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (k) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) pyrene	Not detected	. ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	113	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	79	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	.88	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	95	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1

Lab ID No: AB98612 Client Id: MW-3

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds VPH Aliphatics/Aromatics						70	
C5-C8 Aliphatic Hydrocarbons	Not detected	mg/L	0.075	8/2/00	8/2/00	RLJ	MA VPH 97-1
C9-C12 Aliphatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-1
C9-C10 Aromatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-1
Unadjusted C5-C8 Aliphatics	Not detected	mg/L	0.075	8/2/00	8/2/00	RLJ	MA VPH 97-1
Unadjusted C9-C12 Aliphatics	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-1
Carbon Chain Dilution Factor	1	mg/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
VPH Target Analytes							
Benzene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
Toluene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
Ethylbenzene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
m,p-Xylenes	Not detected	ug/L	10	8/2/00	8/2/00	RLJ	MA VPH 97-1
o-Xylene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
Naphthalene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
Methyl-tert-butyl ether (MTBE)	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) PID	91	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) FID	81	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
4-Bromofluorobenzene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
Target Analytes Dilution Factor	1	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
TPH Preparation							
Separatory Funnel Extraction	Completed			7/27/00	7/27/00	AP	SW846 3510C
Petroleum Hydrocarbon Analysis EPH Aliphatics/Aromatics	39						
C9-C18 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Not detected	mg/L	0.2	8/3/00	8/3/00	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/L		8/3/00	8/3/00	LR	MA EPH 98-1
EPH Target PAH Analytes				1507-00-00-12-0			
Naphthalene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
2-Methylnaphthalene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthylene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Acenaphthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Fluorene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Phenanthrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-
Fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Рутепе	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Chrysene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1

Lab ID No: AB98612 Client Id: MW-3

arameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
enzo (b) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
enzo (k) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (a) pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
deno (1,2,3-cd) pyrene	Not detected	ug/L	5.0	8/3/00 .	8/3/00	LR	MA EPH 98-1
Bibenzo (a,h) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Not detected	ug/L	5.0	8/3/00	8/3/00	LR	MA EPH 98-1
-Chloro-octadecane Aliphatic (%SR)	64	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	86	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
→ Bromonaphthalene Fractionation (%SR)	97	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Bromonaphthalene Fractionation (%SR) Fluorobiphenyl Fractionation (%SR)	97	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/L	0.	8/3/00	8/3/00	LR	MA EPH 98-1
- 1. C.							

Lab ID No: AB98613 Client Id: MW-4

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds		88					
VPH Aliphatics/Aromatics	Not detected		0.075	8/2/00	0/2/00	RLJ	344 3/01/02 1
C5-C8 Aliphatic Hydrocarbons	70 P+37 E 1	mg/L	0.075		8/2/00		MA VPH 97-1
C9-C12 Aliphatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-1
C9-C10 Aromatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-1
Unadjusted C5-C8 Aliphatics	Not detected	mg/L	0.075	8/2/00	8/2/00	RLJ	MA VPH 97-1
Unadjusted C9-C12 Aliphatics	Not detected	mg/L	0.025	8/2/00	8/2/00	RLJ	MA VPH 97-1
Carbon Chain Dilution Factor	1	mg/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
VPII Target Analytes				8/2/00	0/0/00	DIT	244 10011 00 1
Benzene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
Toluene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
Ethylbenzene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
m,p-Xylenes	Not detected	ug/L	10	8/2/00	8/2/00	RLJ	MA VPH 97-1
o-Xylene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
Naphthalene	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
Methyl-tert-butyl ether (MTBE)	Not detected	ug/L	5.0	8/2/00	8/2/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) PID	92	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) FID	85	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
4-Bromofluorobenzene (%SR) GCMS	NA	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
Target Analytes Dilution Factor	1	ug/L	0.	8/2/00	8/2/00	RLJ	MA VPH 97-1
TPH Preparation							
Separatory Funnel Extraction	Completed			7/27/00	7/27/00	AP	SW846 35100
Petroleum Hydrocarbon Analysis EPH Aliphatics/Aromatics							
C9-C18 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	MSL	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	MSL	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Not detected	mg/L	0.2	8/3/00	8/3/00	MSL	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Not detected	mg/L	0.2	8/3/00	8/3/00	MSL	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/L		8/3/00	8/3/00	MSL	MA EPH 98-1
EPH Target PAH Analytes				27	80 ES		92
Naphthalene	Not detected	ug/L	- 5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
2-Methylnaphthalene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-
Acenaphthylene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-
Acenaphthylene Acenaphthene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Fluorene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Phenanthrene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-
Anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-
Fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-
Pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-
Benzo (a) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-
Chrysene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-

Lab ID No: AB98613 Client Id: MW-4

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Benzo (b) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Benzo (k) fluoranthene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Benzo (a) pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
ndeno (1,2,3-cd) pyrene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Dibenzo (a,h) anthracene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
Benzo (g,h,i) perylene	Not detected	ug/L	5.0	8/3/00	8/3/00	MSL	MA EPH 98-1
-Chloro-octadecane Aliphatic (%SR)	106	ug/L	0.	8/3/00	8/3/00	MSL	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	84	ug/L	0.	8/3/00	8/3/00	MSL	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	105	ug/L	0.	8/3/00	8/3/00	MSL	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	108	ug/L	0.	8/3/00	8/3/00	MSL	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/L	0.	8/3/00	8/3/00	MSL	MA EPH 98-1

Lab ID No: AB98614 Client Id: Trip

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
olatile Organic Compounds  PH Aliphatics/Aromatics						5 8	
C5-C8 Aliphatic Hydrocarbons	Not detected	mg/L	0.075	8/2/00	8/2/00	CH	MA VPH 97-12
9-C12 Aliphatic Hydrocarbons	Not detected	mg/L	0.025	. 8/2/00	8/2/00	CH	MA VPH 97-12
9-C10 Aromatic Hydrocarbons	Not detected	mg/L	0.025	8/2/00	8/2/00	CH	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Not detected	mg/L	0.075	8/2/00	8/2/00	CH	MA VPH 97-12
Jnadjusted C9-C12 Aliphatics	Not detected	mg/L	0.025	8/2/00	8/2/00	CH	MA VPH 97-12
Carbon Chain Dilution Factor	I	mg/L	0.	8/2/00	8/2/00	CH	MA VPH 97-12
VPH Target Analytes							
Benzene	Not detected	ug/L	5.0	8/2/00	8/2/00	CH	MA VPH 97-12
Toluene	Not detected	ug/L	5.0	8/2/00	8/2/00	CH	MA VPH 97-12
Ethylbenzene	Not detected	ug/L	5.0	8/2/00	8/2/00	CH	MA VPH 97-12
n,p-Xylenes	Not detected	ug/L	10	8/2/00	8/2/00	CH	MA VPH 97-12
o-Xylene	Not detected	ug/L	5.0	8/2/00	8/2/00	CH	MA VPH 97-12
Naphthalene	Not detected	ug/L	5.0	8/2/00	8/2/00	CH	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Not detected	ug/L	5.0	8/2/00	8/2/00	CH	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	na	ug/L	0.	8/2/00	8/2/00	CH	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID 2,5-Dibromotoluene (%SR) FID	na	ug/L	0.	8/2/00	8/2/00	CH	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	124	ug/L	0.	8/2/00	8/2/00	CH	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	95	ug/L	0.	8/2/00	8/2/00	CH	MA VPH 97-12
Target Analytes Dilution Factor	1	ug/L	0.	8/2/00	8/2/00	CH	MA VPH 97-12

Lab ID No: AB98614

Client Id: Trip

within the method hold time.

Collection Date: 7/24/00 Matrix: Ground Water

Reporting Start Date End Date Analyst rameter Results Units Method Limit The following outlines the condition of all EPH samples contained within this report upon laboratory receipt. □ Soil - □ Sediment □ Other: Aqueous Matrix : ☐ Broken Satisfactory ☐ Leaking Containers O N/A E pH<2 □ pH>2 □ pH adjusted to <2 in lab Aqueous Preservative Comment: Received cold Received ambient Received with temp blank: Received on ice Temperature The following outlines the condition of all VPH samples contained within this report upon laboratory receipt. Aqueous □ Soil ☐ Sediment ☐ Other: Matrix ☑ Satisfactory ☐ Leaking Containers ☐ Broken D pH<2 Aqueous DN/A □ pH>2 Comment: PN/A ☐ Samples NOT received in Methanol or air-tight container Sample ml Methanol/g soil Soil or Preservative ☐ Samples received in Methanol covering soil □ 1:1 +/- 25% not covering soil Sediment Other: ☐ Sample received in air-tight container: Received on ice Received cold Received ambient ☐ Received with temp blank: Temperature Were all QA/QC procedures followed as required by the VPH method? Yes Were any significant modifications made to the VPH method, as specified in Section 11.3? No \* see below Were all QA/QC procedures followed as required by the EPH method? Yes No Were any significant modifications made to the EPH method, as specified in Section 11.3? Yes \*\*see below Were all performance/acceptance standards for required QA/QC procedures achieved? Yes \* Yes, if PID and FID surrogate recoveries are listed as n/a, then that sample was run via GCMS using all QC criteria specified in the method. \*\* Sample(s) was run via GCMS using all QC criteria specified in the method. I attest that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete. Reviewed by: 8/8/00 Quality Service/Quality Assurance Depts. resident/Laboratory Director Note: In order to verify if low-level chlorinated halocarbons are present, resampling is necessary to perform the analysis



# SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

#### Laboratory Report Supplement <u>References</u>

SW 846	Test Methods for Evaluating Solid Waste. Third edition, 1998
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act
10 CFR 141	National Primary Drinking Water Regulations
40 CFR 143	National Secondary Drinking Water Regulations
40 CFR 160	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Good Laboratory Practice Standards
APHA-AWWA-WPCF	Standard Methods for the Examination of Water and Wastewater. 19th edition, 1995
ASTM D 3328	Standard Methods for the Comparison of Waterborne Petroleum Oils by Gas Chromatography
ASTM D 3328 EPA 540/G-87/003	Data Quality Objectives for Remediation Response Activities, Development Process
EPA 600/4-79-012	Quality Assurance Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-019 EPA 600/4-79-020	Handbook for Analytical Quality Control in Water and Wastewater Laboratories
	Method for the Chemical Analysis of Water and Wastes
EPA 600/4-82-057 EPA 600/4-85/056	Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater
EPA 600/4-85/056	Choosing Cost-Effective QA/QC Programs for Chemical Analysis
EPA 600/4-88/039	Method for the Determination of Organic Compounds in Drinking Water
CT ETPH MADEP EPH	Analysis of Extractable Total Petroleum Hydrocarbons (ETPH)
MADEP EPH	Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)
MADEP VPH	Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)
QAMS 004/80	Guidelines and Specifications for Preparing Quality Assurance Program Plans, USEPA Office of Monitoring System and Quality Assurance

GC-D-52-77 Oil Spill Identification System

#### Acronyms & Abbreviations

AA	Atomic Absorption	MS	Matrix Spike
ASTM	American Society for Testing and Materials	MSD	Matrix Spike Duplicate
BOD	Biological Oxygen Demand	NTU	Nephelometric Turbidity Units
°C	degree(s) Celsius	PAHs	Polynuclear Aromatic Hydrocarbons
COD	Chemical Oxygen Demand	PCBs	Polychlorinated Biphenyls
CMR	Code of Massachusetts Regulations	PID	Photo Ionization Detector
DEP	Department of Environmental Protection	PQL	Practical Quantitation Limit
DI	De-ionized	R	Recovery (%R: Percent Recovery)
DO	Dissolved Oxygen	RSD	Relative Standard Deviation
EPA	Environmental Protection Agency	SM	Standard Method
EPH	Extractable Petroleum Hydrocarbons	SR -	Surrogate Recovery (%SR)
FID	Flame Ionization Detector	sw	Solid Waste
GC	Gas Chromatograph	THM	Trihalomethane(s)
GC/MS	Gas Chromatograph / Mass Spectrometer	TOC	Total Organic Carbon
ICP	Inductively Coupled Plasma	TOX	Total Organic Halogen
Id	Identification	TPH	Total Petroleum Hydrocarbons
MCL	Maximum Contaminant Level	VOC	Volatile Organic Compound
MDL	Minimum Detection Limit	VPH	Volatile Petroleum Hydrocarbons



Festuring HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

of

Page

Standard TAT - 7 to 10 business days Special Handling: C Rush TAT - Date Needed:

All TATs are subject to laboratory approval.
 Min. 24-hour notification is needed for rushes.

· All samples are disposed of after 60 days

unless otherwise instructed.

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11 Almgren Drive - Agawam, Massachusetts 01001 · 413-789-9018 · Fax 413-789-4076



#### SPECTRUM ANALYTICAL, INC.

### Featuring HANIBAL TECHNOLOGY

Massachusetts Certification # M-MA138 Rhode Island # 98 Maine # MA138 Florida # E87600 / 87562 New Hampshire # 2538 Connecticut # PH-0777 New York # 11393

ECS, Inc.

588 Silver Street Agawam, MA 01001

Attn: Mark A. Haynes

Client Project Number: 13997

8/9/00

Location: 115 Wayside Ave-W. Spfld, MA

Laboratory ID	Client Sample ID	Analyses Requested
AC00761	MW-1	Purgeable Halocarbons
AC00762	MW-2	Purgeable Halocarbons
AC00763	MW-3	Purgeable Halocarbons
AC00764 .	MW-4	Purgeable Halocarbons
AC00765	Tripblank	· Purgeable Halocarbons
		10 10

I attest that all information contained within this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method including any data obtained from a subcontract laboratory.

Hanibal C. Tayeh

President/Laboratory Director

#### SPECTRUM ANALYTICAL, INC.

Laboratory Report

Location: 115 Wayside Ave-W. Spfld, MA

Client: ECS

Lab ID No: AC00761 Client Id: MW-1 Client Project No: 13997

Submittal Date: 8/8/00 Collection Date: 8/8/00

Matrix: Ground Water

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds							
Purgeable Halocarbons							
Bromodichloromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Bromoform	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Bromomethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Carbon tetrachloride	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chloroethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Chloroform	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chloromethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Dibromochloromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,3-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,4-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Dichlorodifluoromethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
1,1-Dichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
cis-1,2-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
trans-1,2-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichloropropane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
cis-1,3-Dichloropropene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
trans-1,3-Dichloropropene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Methylene chloride	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00 .	GM	EPA 601
Tetrachloroethene (PCE)	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,1-Trichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,2-Trichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Trichloroethene (TCE)	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Trichlorofluoromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Vinyl chloride	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
4-Bromofluorobenzene (%SR)	95	ug/L		8/8/00	8/8/00	GM	EPA 601
Chlorobenzene-d5 (%SR)	94	ug/L		8/8/00	8/8/00	GM	EPA 601

Lab ID No: AC00762 Client Id: MW-2

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds		13				/55	
Purgeable Halocarbons		8.3	100			1	
Bromodichloromethane	Not detected	· ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Bromoform	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Bromomethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Carbon tetrachloride	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chloroethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Chloroform	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chloromethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Dibromochloromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,3-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,4-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Dichlorodifluoromethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
1,1-Dichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1-Dichloroethane 1,2-Dichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
cis-1,2-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
cis-1,2-Dichloroethene trans-1,2-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichloropropane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
cis-1,3-Dichloropropene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
trans-1,3-Dichloropropene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Methylene chloride	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Tetrachloroethene (PCE)	1.4	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,1-Trichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,2-Trichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Trichloroethene (TCE)	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Trichlorofluoromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Vinyl chloride		ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
4-Bromofluorobenzene (%SR)	96	ug/L		8/8/00	8/8/00	GM	EPA 601
Chlorobenzene-d5 (%SR)	95	ug/L		8/8/00	8/8/00	GM	EPA 601

Lab ID No: AC00763 Client Id: MW-3

Parameter -	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds						70	
Purgeable Halocarbons		1. A.A.	85 W		£6	и е	¥93
Bromodichloromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Bromoform	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Bromomethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Carbon tetrachloride	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chloroethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Chloroform	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Chloromethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
Dibromochloromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,3-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,4-Dichlorobenzene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Dichlorodifluoromethane	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
1,1-Dichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
cis-1,2-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
trans-1,2-Dichloroethene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,2-Dichloropropane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	-EPA 601
cis-1,3-Dichloropropene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
trans-1,3-Dichloropropene	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Methylene chloride	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Tetrachloroethene (PCE)	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,1-Trichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
1,1,2-Trichloroethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Trichloroethene (TCE)	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Trichlorofluoromethane	Not detected	ug/L	1.0	8/8/00	8/8/00	GM	EPA 601
Vinyl chloride	Not detected	ug/L	2.0	8/8/00	8/8/00	GM	EPA 601
4-Bromofluorobenzene (%SR)	98	ug/L	0.000	8/8/00	8/8/00	GM	EPA 601
Chlorobenzene-d5 (%SR)	96	ug/L		8/8/00	8/8/00	GM	EPA 601

Lab ID No: AC00764 Client Id: MW-4

Parameter	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds						*	
Purgeable Halocarbons	F 2 54	4 2				2 1 2	W02 19
Bromodichloromethane 3.2	Not detected	ug/L	1.0	8/9/00	8/9/00	DG ·	EPA 601
Bromoform	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Bromomethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
Carbon tetrachloride	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Chlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Chloroethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
Chloroform	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Chloromethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
Dibromochloromethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,2-Dichlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,3-Dichlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,4-Dichlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Dichlorodifluoromethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
1,1-Dichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,2-Dichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,1-Dichloroethene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
cis-1,2-Dichloroethene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
trans-1,2-Dichloroethene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,2-Dichloropropane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
cis-1,3-Dichloropropene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
trans-1,3-Dichloropropene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Methylene chloride	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Tetrachloroethene (PCE)	1.4	ug/L	1.0	8/9/00	8/9/00	DG	EPA 60
1,1,1-Trichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,1,2-Trichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Trichloroethene (TCE)	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Trichlorofluoromethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Vinyl chloride	Not detected	ug/L	. 2.0	8/9/00	8/9/00	DG	EPA 601
4-Bromofluorobenzene (%SR)	124	ug/L		8/9/00	8/9/00	DG	EPA 601
Chlorobenzene-d5 (%SR)	116	ug/L		8/9/00	8/9/00	DG	EPA 601

Lab ID No: AC00765 Client Id: Tripblank

Parameter 	Results	Units	Reporting Limit	Start Date	End Date	Analyst	Method
Volatile Organic Compounds							
Purgeable Halocarbons		. * +6	+ 4	50	200	. 4.	11.00
Bromodichloromethane *2-	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Bromoform	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Bromomethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
Carbon tetrachloride	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Chlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Chloroethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
Chloroform	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Chloromethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
Dibromochloromethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,2-Dichlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,3-Dichlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,4-Dichlorobenzene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Dichlorodifluoromethane	Not detected	ug/L	2.0	8/9/00	8/9/00	DG	EPA 601
1,1-Dichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,1-Dichloroethane 1,2-Dichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,1-Dichloroethene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
cis-1,2-Dichloroethene	Not detected	ug/L	- 1.0	8/9/00	8/9/00	DG	EPA 601
trans-1,2-Dichloroethene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,2-Dichloropropane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
cis-1,3-Dichloropropene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
trans-1,3-Dichloropropene	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Methylene chloride	Not detected	ug/L	2.5	8/9/00	8/9/00	DG	EPA 601
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG ·	EPA 601
Tetrachloroethene (PCE)	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,1,1-Trichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
1,1,2-Trichloroethane	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Trichloroethene (TCE)	Not detected	ug/L	1.0	8/9/00	8/9/00	DG	EPA 601
Trichlorofluoromethane	Not detected	ug/L	1.0	8/9/00 -	8/9/00	DG	EPA 601
Vinyl chloride	Not detected	ug/L	2.0		8/9/00	DG	EPA 601
4-Bromofluorobenzene (%SR)	117	ug/L	57. ta	8/9/00	8/9/00	DG	EPA 601
Chlorobenzene-d5 (%SR)	115	ug/L		8/9/00	8/9/00	DG	EPA 601

Lab ID No: AC00765 Client Id: Tripblank

Quality Service/Quality Assurance Depts.

Collection Date: 8/8/00 Matrix: Ground Water

Parameter

Results

Units

Reporting Start Date End Date Analyst Limit

Method

Reviewed by:

Validated by:

-

President/Laboratory Director

8/9/00



# SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

## Laboratory Report Supplement References

SW 846	Test Methods for Evaluating Solid Waste, Third edition, 1998
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act
40 CFR 141	National Primary Drinking Water Regulations
40 CFR 143	National Secondary Drinking Water Regulations
40 CFR 160	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Good Laboratory Practice Standards
APHA-AWWA-WPCF	Standard Methods for the Examination of Water and Wastewater. 19th edition, 1995
ASTM D 3328	Standard Methods for the Comparison of Waterborne Petroleum Oils by Gas Chromatography
EPA 540/G-87/003	Data Quality Objectives for Remediation Response Activities, Development Process
EPA 600/4-79-012	Quality Assurance Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-019	Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-020	Method for the Chemical Analysis of Water and Wastes
EPA 600/4-82-057	Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater
EPA 600/4-85/056	Choosing Cost-Effective QA/QC Programs for Chemical Analysis
EPA 600/4-88/039	Method for the Determination of Organic Compounds in Drinking Water
CT ETPH	Analysis of Extractable Total Petroleum Hydrocarbons (ETPH)
MADEP EPH	Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)
MADEP VPH	Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)
QAMS 004/80	Guidelines and Specifications for Preparing Quality Assurance Program Plans, USEPA Office of Monitoring System and Quality Assurance
GC-D-52-77	Oil Spill Identification System

#### Acronyms & Abbreviations

·AA	Atomic Absorption	MS	Matrix Spike
ASTM	American Society for Testing and Materials	MSD	Matrix Spike Duplicate
BOD -	Biological Oxygen Demand	NTÙ	Nephelometric Turbidity Units
°C:	degree(s) Celsius	PAHs	Polynuclear Aromatic Hydrocarbons
COD	Chemical Oxygen Demand	PCBs	Polychlorinated Biphenyls
CMR	Code of Massachusetts Regulations	PID	Photo Ionization Detector
DEP	Department of Environmental Protection	PQL	Practical Quantitation Limit
DI	De-ionized	R	Recovery (%R: Percent Recovery)
DO	Dissolved Oxygen	RSD	Relative Standard Deviation
EPA	Environmental Protection Agency	SM	Standard Method
EPH	Extractable Petroleum Hydrocarbons	SR	Surrogate Recovery (%SR)
FID	Flame Ionization Detector	sw	Solid Waste
GC	Gas Chromatograph	THM	Trihalomethane(s)
GC/MS	Gas Chromatograph / Mass Spectrometer	TOC	Total Organic Carbon
ICP	Inductively Coupled Plasma	TOX	Total Organic Halogen
Id	Identification	TPH	Total Petroleum Hydrocarbons
MCL '	Maximum Contaminant Level	VOC	Volatile Organic Compound
MDL	Minimum Detection Limit	VPH	Volatile Petroleum Hydrocarbons



CHAIN OF CUSTODY RECORD

Special Handling:

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· All TATs are subject to laboratory approval. Standard TAT - 7 to 10 business days ST Rush TAT - Date Needed: 3/9/0

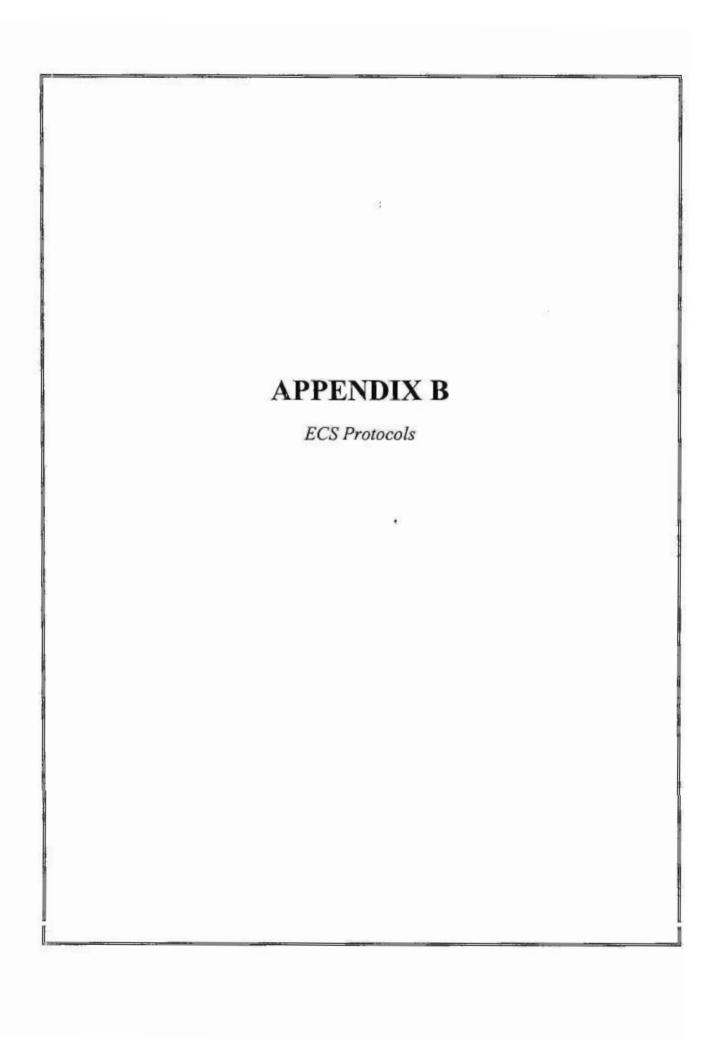
· Min. 24-hour notification is needed for rushes. · All samples are disposed of after 60 days

Fathering HANIBAL TECHNOLOGY	Page /	1 Jo	<ul> <li>All samples are disposed of after 60 days unless otherwise instructed.</li> </ul>
Report To: ECS	Invoice To: £CS		Project No.: 1347
			W. Sp. shapeld
Project Mgr.: MM	P.O. No.:	RQN:	Sampler(s): Lvy 17
1=Na <sub>3</sub> S <sub>2</sub> O <sub>3</sub> 2=HCl 3=H <sub>2</sub> SO <sub>4</sub> 4=HNO <sub>3</sub> 5=NaOH 6=Ascorbic Acid 7=CH <sub>3</sub> OH 8=NaHSO <sub>4</sub> 9= 10=	6=Ascorbic Acid	Containers:	Analyses:
DW+Drinking Water GW=Groundwater WW=Wastewater SW= Surface Water SO=Soil SL=Sludge O=Oil A=A X1= X2= X3=	_ H [	Glass Glass CLook	
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11 Almgren Drive • Agawam, Massachusetts 01001 • 413-789-9018 • Fax 413-789-4076 • www.spectrum-analytical.com

□ E-mail results when available to . ☐ Fax results when available to (



#### DRILLING EQUIPMENT STANDARDS

#### 1. EQUIPMENT DECONTAMINATION

All drilling equipment and associated tools, including but not limited to, augers, flushthreaded casing, drill rods, sampling equipment, wrenches, etc., that may have come in contact with any material which could cause contamination shall be decontaminated using a high pressure detergent steam cleaning equipment, followed by, if needed a nanograde methanol swabbing. This will be followed by a distilled or controlled water rinse. The control water shall be obtained from a source approved by the supervising field representative.

#### 2. EQUIPMENT AND MATERIALS

All equipment will be in good repair and in proper working order with no visible signs of oil or hydraulic fluid leaks.

The drill rig shall be capable of providing a power driven sectional hollow stem auger and/or flush-threaded casing with a minimum inside diameter of 2 1/2 inches to a minimum depth of 60 feet. In addition, the following equipment shall be available:

- Drill Rods, minimum size equivalent to the "A" Rod, (1 5/8 inches 0.D. and 1 1/8 I.D.);
- lb. Drive Hammer and 300 lb. Drive Hammer;
- Split-spoon Samplers;
- Hollow Stem Auger Plug;
- Roller Bit and Diamond Corer Bit;
- · Water Tank and Pump;
- Any other equipment needed to successfully complete job.

Document No. 11146.2 Revised: March, 2001 Page 1

#### MONITORING WELL CONSTRUCTION PROCEDURE

The following Monitoring Well construction procedures are based on standard methods found in the Massachusetts Department of Environmental Protection (DEP) "Standard References for Monitoring Wells" (WSC-310-91) and the United States Environmental Protection Agency (EPA) "Subsurface Characterization and Monitoring Techniques: Volume 1" (EPA/625/R-93/00300)

#### 1. MONITORING WELL MATERIALS

All materials used in the completion of monitoring wells shall be in good condition and free of any signs of possible contamination. The following materials may be used in the completion of monitoring wells.

- Schedule 40, flush-joint threaded PVC slotted well screen and solid riser
- Clean silica sand (graded appropriately for site-specific formation; No. 2 typical)
- Bentonite pellets and grout
- Portland Cement
- Flush-mounted curb box or vented steel locking aboveground protective well-casing and lock.

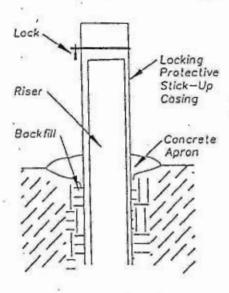
The attached Figure depicts a typical well construction schematic.

#### 2. PROCEDURES

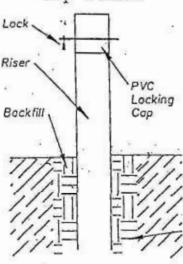
- Upon establishing the bottom elevation of the monitoring well, followed by the placement of a specified length of well screen and riser within the drill casing. If warranted, filter fabric may be placed on the screen prior to insertion into the drill casing to facilitate filtration. The sand pack will then be continuously added to the annular space as the drill casing are withdrawn. The drill casing will not be pulled above the sand as it is added, ensuring the placement of a continuous sand pack. A weighted tape will be used to continuously monitor the sand pack elevation relative to the auger bottom to ensure the screen has been fully covered. Unless otherwise specified, the sand pack will be placed to an elevation of two feet above the top of the well screen.
- A one-foot (or greater if specified) thick bentonite seal composed of pellets or chips will be added to the annular space. If the seal is placed above the water table, the pellets will be hydrated with potable water. A weighted tape will be used to assure that the bentonite is placed at the proper elevation, is the proper thickness, and is not hung up in the borehole. The drill casing will be withdrawn from above the elevation of the bentonite seal and the natural materials will be allowed to collapse, if specified. If natural materials are not collapsing, clean native materials or No. 2 silica sand will be used to fill the voids.

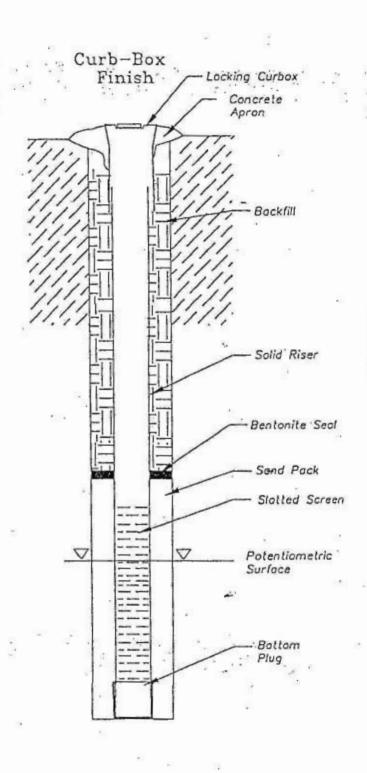
- From the top of the bentonite seal to two feet below grade, the annular space will be backfilled with natural materials unless other materials are specified.
- If well is to be screened below the water table, the annular space above the bentonite seal is
  to backfilled with a cement/bentonite grout, mixed according to a ratio of approximately
  20:1 cement to bentonite (not less than 5:1, if porous formations require more bentonite),
  with a maximum of 8 gallons of water per 94-pound bag of cement. Grout to be put in
  place with a sideways or upwards discharging tremie pipe.
- Each well will be completed with either a flush mount or elevated locking, protective casing as specified. Any asphalt or concrete surface will be square-cut. The flush mount casings will be set in Portland cement that extends from the top of the native fill to ground surface. The cement seal shall be a minimum of 2 feet in diameter. The top of the cement surface will be tapered outward to drain water away from the well.
- A vent hole will be placed near the top of a solid riser. On wells with a flush mount
  protective casing, a vented, locking compression cap will be used to plug the PVC riser.
  The wells requiring an aboveground protective casings will be completed with a vented
  slip-on PVC cap and locking metal cover.

Locking Protective Pipe Finish



Locking PVC Cap Finish





GROUNDWATER MONITORING WELL With Alternative Finishings

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		WATER OBSER	1		CASING	SAMPLER	CORE BARREL				
	ale ·	Depth	Stabilization Time		Hollow Stem Auger	Split Spoon		Casing Elevation (fl.)		15.088.995	
		·	1	INSIDE DIAMETER	4.25*	1 3/8*		PVC Elevation (it.)			
-		-	-	HANNER WEIGHT		140 lbs	+ +	Surface Elevation (ft.)		1200000-000-000	
			-	HAMMER FALL		30-		Date Started	T.	-20-200	
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Well sand. Dardonita seat:

Natural Fill,

Well screen..

<sup>1.</sup> Field testing values represent total votable organic vapors (referenced to a benzene standard) measured in the headspace of sealed soit sample jars with an H-Nu Model PIO Photoionization Meter. Results reported in parts per million (ppm). Detection limit = 0,2 ppm. BDL = Below Detection Limit.

Groundwater encountered at approximately 7 feet below grade.

<sup>3.</sup> Completed at 15" as a 2" diameter monitoring well, 10" of 0.010" slotted screen, 5" of solid riser, sand pack between 15" and 4", bentonite seal from 4" to 3", natural fill to surface, casing and cement flush to ground surface.

## GENERAL SAMPLING PROCEDURES FOR AQUEOUS AND SOLID MATRICES

- During field sampling activities, the following applicable procedures will be practiced for sample collection:
- Whenever possible, samples will be collected first from the location expected to be least contaminated. Samples that are expected to be most contaminated will be collected last.
- Accurate and detailed field notes will be maintained in a bound field notebook. Soil samples will be examined and logged in the field.
- Sampling procedures will be performed with the overall intent of collecting representative samples and minimizing sample disturbance.
- Soil samples will be selected for analysis based on the results of qualitative field screening for total volatile organic vapors, visual and olfactory observations, and the depth of the water table.
- Sample containers will be labeled with the site name, project number and date prior to being filled with a sample.
- All sample collection, handling, and shipping information will be recorded in a field notebook.
- Groundwater samples will be logged, using the attached Groundwater Sampling Log.
   Samples of other matrices (sediment, surface water, soil, etc.) will be logged, using the attached Field Sampling Log.
- All samples should be collected according the specific requirements of the intended analytical method. Tables 1 and 2 provide lists of sample containers, preservation and holding time requirements for aqueous and soil/sediment samples, respectively.
- All samples will be placed in a chilled, thermally-insulated container containing ice. Blue
  ice, ice packs, or ice substitutes are not able to reach and maintain the required temperature
  until receipt at a laboratory.
- All soil samples for volatile organic compound analysis must be collected, preserved, and handled accordingly to SW846 Method 5035. The procedures are outlined in attached memorandum from Spectrum Analytical.
- All samples to be analyzed by Massachusetts Department of Environmental Protection methodologies for Volatile Petroleum Hydrocarbons (VPH) and Extractable Petroleum Hydrocarbons (EPH) will be collected according the published MADEP procedures outlined in the attached memorandum from Spectrum Analytical, Inc.

Environmental Compliance Services, Inc. 588 Silver Street, Agawam, Massachusetts 01001 MA: (413) 789-3530 FAX: (413) 789-2776

# WELL SAMPLING LOG

Personnel:   Post   Total   Octobri to   Post   Maker   Violance   Post   Maker   Violance   Post   Maker   Violance   Post   Maker   Post   Post   Post   Maker   Post   Maker   Post	Client:									Job Number:	U		THE PERSON NAMED IN	1	4	Sheet 1 of 1
Table   Depth to De	xcation:		200000							Dale:				190 M 1/19		
Total Depth to Depth to Depth to Depth to Depth to Product Water Volume   Product   Water Thickness Height Purged Odors Readings Oxygen   Product   Water Thickness Height Purged Odors Readings Oxygen   Product   Water Thickness Height Purged Odors Readings   Trime   Thickness   Trime   Thickness   Trime   T	ersonnel:	2004			æ					Weather Co	nditions:					
Ion & Equipment         NA         Alconox, methanol, DI           Slope         NA         Mathanol, DI           Couning         NA         Methanol, DI		Point of Reference (PVC/RIm)	Total Depth (feet)	Depth to Product (feet)	Water (feet)		Water Height (feet)	Volume Purged (gallons)			Dissolved Oxygen (mg/L)	Æ	Sp. Cond.	Temp (°C)	Sample	Comments
Slope   NA Methanol, DI   Corning																
Siope   NA Methanol, DI   October				7												+ 100
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ion & Equipment Manufacturer/Model I.D. Calibration Decon  NA NA Alconox, methanol, DI  Slope NA Methanol, DI  Corning Methanol, DI																80
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ion & Equipment Manufacturer/Model I.D. Calibration Decon  NA Atconox, methanol, DI  Stope NA Methanol, DI  Corning Methanol, DI																
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#### ENVIRONMENTAL COMPLIANCE SERVICES Inc.

588 Silver Street

Agawam, Massachusetts 01001

(413) 789 - 3530

## FIELD SAMPLING

LOG

Sheet \_\_\_\_ of \_\_\_

CLIENT:						JOB No:	
AUDIER (S)				WEATH	ER CON	DITIONS:	
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SAMPLING	EQUIPMEN	<u>r</u>					

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1 L 3

14 days

14/40 days 6

14/40 days 6



## Featuring HANIBAL TECHNOLOGY

Table 1

#### Recommended Containers, Preservation, Storage, & Holding Times For Water and Wastewater Prep/Analysis Sample Preservative<sup>2</sup> Description Method Matrix Volume Container1 Holding Time Volatile/Semivolatile Analyses Cool 4º C G (b) 40 ml 3,4 H,O Ethylene Dibromide (EDB) 504.1 14 days 75µL Na2S2O3 Tef Sep Solution G (b) Cool 4º C 40 ml 3,4 GC-Purgeable Halocarbons 601 11,0 14 days HCl to pH<2 2 Tel Sep G (b) Cool 4º C 40 ml 3,4 14 days 5 GC-Purgeable Aromatics 602 H<sub>2</sub>O HCl to pH<2 2,5 Tef Scp Cool 4º C AG(a) IL 3,4 GC-Pesticides & PCBs 7/40 days 6 608 H<sub>2</sub>O NaOH or H2SO4 to Tef Cap pH 5-92 AG(a) 1 L 3,4 HPLC or GC-PAHs Cool 4º C2 7/40 days 6 610 H<sub>2</sub>O Tef Cap Cool 4º C 624 G (b) 40 ml 3,4 14 days 5 GC/MS Purgeables H<sub>2</sub>O HCl to pH<2 2,5 524.2 Tef Cap AG (a) 1 L 23 Cool 4º C 625 7/40 days 6 GC/MS Semivolatiles H,O Tef Cap Petroleum Hydrocarbon Analyses 413.1 AG(a) Cool 4°C 1 L 3 413.2 28 days 7 Oil & Grease H<sub>2</sub>O H2SO4 to pH<2 Tef Cap 1664 AG(a) Cool 4º C Total Recoverable Petroleum 1 L 3 418.1 H<sub>2</sub>O 28 days 7 Hydrocarbons by IR HCl to pH<2 Tef Cap G (b) Cool 4° C Modified 1 L 3 Diesel Range Organics (DRO) H20 -14/40 days 6 8015B HCl to pH <2 Tef Cap

G (b)

Tef Sep G (a)

Tef Cap

G (a)

Tef Cap

Modified

8015B

Modified 8100

Florida Pro

98-1

97-12

8015B

Gasoline Range Organics (GRO)

Total Petroleum Hydrocarbons

Total Petroleum Hydrocarbons

by GC

by GC

MA DEP EPH

MA DEP VPH

CT DPH ETPH

H<sub>2</sub>O

H<sub>2</sub>O

H<sub>2</sub>O

H<sub>2</sub>O

H<sub>2</sub>O

H<sub>2</sub>O

Cool 4º C

HCl to pH <2

Cool 4º C

HCl to pH <2

Cool 4º C

HCl to pH <2

See Table 3

See Table 4

See Table 5

#### ENVIRONMENTAL ANALYSES

Reco		ners, Pres	able 1 ervation, Storage and Wastewater	e, & Holding Times		15.
Description	Method	Matrix	Sample Container	Preservative <sup>2</sup>	Prep/Analysis Holding Time	Volume
Metal Analyses		10.				*
AA Metals	200 Series	H <sub>2</sub> O	P or G (c)	Cool 4° C HNO <sub>3</sub> to pH<2 <sup>8</sup>	6 months	' 250 ml
ICP Metals	200.7	H <sub>2</sub> O	P or G (c)	Cool 4° C HNO <sub>3</sub> to pH<2 <sup>8</sup>	6 months	250 ml
Mercury	245.1	H <sub>2</sub> O	P or G (c)	Cool 4° C HNO <sub>3</sub> to pH<2 8	28 days 9	250 ml
Chrornium VI	218.4	H <sub>2</sub> O	P or G	Cool 4º C	24 hours	200 ml
Lead, Organic	CA LUFT	H₂O	G (a) Tef Cap	Cool 4º C	Analyze immediately	1 L 3
Inorganic/Wet Chemistry Analy	ses					
Ion Chromatography Anions	300.0	H <sub>2</sub> O	P or G	Cool 4º C	28 days 10	500 ml
Acid ty .	305.1	H <sub>2</sub> O	P or G	Cool 4° C	. 14 days	150 ml
Alkalinity	310.1	H <sub>2</sub> O	P or G	Cool 4° C	14 days	150 ml
BOD	405.1	H <sub>2</sub> O	P or G	Cool 4° C	48 hours	1 L
Bromide	320.1	H <sub>2</sub> O	PorG	Cool 4º C	28 days	100 ml
BTU	ASTMD 240 -	H <sub>2</sub> O	P or G	Cool 4° C	28 days	50 ml
Carbon Dioxide	SM4500CO <sub>2</sub> D	H₂O	P or G	Cool 4° C	Analyze immediately	100 ml
Chloride	325.1	H <sub>2</sub> O	P or G	None Required	28 days	150 ml
Chlorine, Total Residual	330.1	H <sub>2</sub> O	P or G	None Required	Analyze immediately	200 ml
COD	410.4	H <sub>2</sub> O	P or G	Cool 4° C H <sub>2</sub> SO <sub>4</sub> to pH<2	28 days	50 ml
Coliform, Fecal	SM 9220	H <sub>2</sub> O	Sterile Plastic	Cool 4º C2	6 hours	100 ml
Coliform, Fecal Strep	SM 9230	H <sub>2</sub> O	Sterile Plastic	Cool 4º C2	6 hours	100 ml
Coliform, Total	SM 9222	H <sub>2</sub> O	Sterile Plastic	Cool 4° C2	30 hours	100 ml
Coliform, Standard Plate Count	SM 907C	H <sub>2</sub> O	Sterile Plastic	Cool 4º C2	24 hours	100 ml
Cclor	110.2	H <sub>2</sub> O	Sterile Plastic	Cool 4º C	48 hours	200 ml
Conductance, Specific	120.1	H <sub>2</sub> O	PorG	Cool 4º C	24 hours	100 ml
Cyanide, Amenable	335.1	H <sub>2</sub> O	P or G (a)	Cool 4° C NaOH to pH>12 2	14 days	500 ml
Cyanide, Physiologically Available	335.3	H <sub>2</sub> O	P or G (a)	Cool 4° C NaOH to pH>12°	14 days	500 ml
Cyanide, Total	335,4	H <sub>2</sub> O	P or G (a)	Cool 4° C NaOH to pH>12 2	14 days	500 ml
Cyanide, Weak Acid Lissociable	SM4500 CN-I	H <sub>2</sub> O	P or G (a)	Cool 4° C NaOH to pH>12 2	14 days	500 ml
Flash Point -	1010	H <sub>2</sub> O	P or G	Cool 4º C	ASAP	50 ml
Fluoride	340.2	H <sub>2</sub> O	P or G	None Required	28 days	200 ml

Table 1 Recommended Containers, Preservation, Storage, & Holding Times For Water and Wastewater

Description	Method	Matrix	Sample Container	Preservative <sup>2</sup>	Prep/Analysis Holding Time	Volume
Hardness -	130.1 130.2	H <sub>2</sub> O	P or G	Cool 4° C HNO <sub>3</sub> to pH<2	6 months	100 ml
odide	345.1	H <sub>2</sub> O	P or G	Cool 40 C	24 hours	100 ml
MBAS (Surfactants)	425.1	H <sub>2</sub> O	P or G	Cool 4° C	48 hours	250 ml
Nitrogen, Ammonia	350.1 350.2	H <sub>2</sub> O	P or G	Cool 4° C H 2SO4 to pH<2	28 days	400 ml
Nitrogen, Total Kjeldahl	351.1 351.3	H <sub>2</sub> O	P or G	Cool 4° C H <sub>2</sub> SO <sub>4</sub> to pH<2	28 days	500 ml
Nitrogen, Nitrate	352.1	H <sub>2</sub> O	P or G	Cool 4°C	48 hours	250 ml
Nitrogan, Nitrate plus Nitrite	353.2 353.3	H <sub>2</sub> O	P or G	Cool 4° C H <sub>2</sub> SO <sub>4</sub> to pH<2	28 days	100 ml
Nitrogen, Nitrite	354.1	H <sub>2</sub> O	P or G	Cool 4 ° C	48 hours	100 ml
Odor .	140.1	H <sub>2</sub> O	G	Cool 4 ° C	24 hours	500 ml
Orthophosphate	365.2	H₂O	P or G	Filter immediately Cool 4° C	48 hours	100 ml
Oxygen, Dissolved	360.1 360.2	H <sub>2</sub> O	G Bottle and Top	None Required	Analyze immediately	300 ml
pH , Hydrogen ion	150.1 150.2	H <sub>2</sub> O	P or G	None Required	Analyze immediately	25 ml
Phenolics	420.1	H <sub>2</sub> O	G	Cool 4° C H <sub>2</sub> SO <sub>4</sub> to pH<2	28 days	1 L 3
Phosphorous, Total	365.2	H <sub>2</sub> O	P or G	Cool 4° C H₂SO₄ to pH<2	28 days	500 ml
Phosphorous, Dissolved	365.2	H <sub>2</sub> O	P or G	Filter immediately Cool 4° C H <sub>2</sub> SO <sub>4</sub> to pH<2	. 24 hours	500 ml
Residue, Filterable (TDS)	160.1	H <sub>2</sub> O	P or G	Cool 4° C	7 days	300 ml
Residue, Non-filterable (TSS)	160.2	H <sub>2</sub> O	PorG	Cool 4° C	7 days	300 ml
Residue, Total	160.3	H <sub>2</sub> O	- P or G	Cool 4° C	7 days	300 ml
Residue, Volatile	160.4	H <sub>2</sub> O	P or G	Cool 4º C	- 7 days	100 ml
Salinity	S210A	H <sub>2</sub> O	P or G	Cool 4º C	28 days	100 ml
Silica	200.7	H <sub>2</sub> O	P	Cool 4º C	28 days	200 ml
Settleable Solids	160.5	H <sub>2</sub> O	P or G	Cool 4° C	48 hours	1 L
Specific Gravity	ASTM D1298	H <sub>2</sub> O	P or G	Cool 4° C	28 days	500 m
Sulfate	375.2	H <sub>2</sub> O	P or G	Cool 4° C	28 days	300 m
Sulfide	376.1	H <sub>2</sub> O	P or G	Cool 4° C pH>9 11	7 days	500 m
Sulfite	377.1	H <sub>2</sub> O	P or G	None Required	Analyze immediately	100 m
Temperature .	170.1	H <sub>2</sub> O	P or G	None Required	Analyze immediately	1 L

Table 1
Recommended Containers, Preservation, Storage, & Holding Times
For Water and Wastewater

Description	Method	Matrix	Sample Container	Preservative <sup>2</sup>	Prep/Analysis Holding Time	Volume
Total Organic Carbon (TOC)	415.1	H <sub>2</sub> O	AG (a)	Cool 4° C H <sub>2</sub> SO <sub>4</sub> to pH<2	28 days	40 ml
Total Crganic Halogens (TOX)	SW 9020B	H <sub>2</sub> O	AG	Cool 4° C	28 days	200 ml
Turbidity	180.1	H <sub>2</sub> O	P or G	Cool 4° C	48 hours	100 ml

#### Notes:

10

G(x) = glass; AG(x) = amber glass; P(x) = plastic; Tef Sep = Teflon septum; Tef Cap = Teflon lined cap; x = cleaning protocol as follows: a = acid wash + solvent wash + oven dry; b = oven dry; c = acid wash.

For organics and bacteriological analysis, sodium thiosulfate is required for all chlorinated waters. For cyanide, use 0.6g ascorbic acid. Dechlorination must be performed prior to the addition of any necessary preservative.

Samples must be provided in duplicate to cover for breakage and provide sufficient sample for QC procedures. Extractable organics with matrix spike/matrix spike duplicate QC protocols require a triplicate sample.

Fill completely to avoid volatile loss.

5 Samples with purgeable aromatics must be acidified with HCl to pH<2 in order to have a 14-day holding time.

Holding time is seven days from sample collection date for extraction, 40 days from extraction date for analysis of

the extract. Holding time is fourteen days for extraction if listed as 14/40.

The EPA has not recommended petroleum hydrocarbon holding times. The holding time given is the laboratory practice by analogy with Oil and Grease standards. State of New Jersey holding time is 7 days. California LUFT is 14 days.

For the determination of dissolved elements, the sample must be filtered through a 0.45 µm pore diameter membrane filter (prior to acidification) at the time of collection or as soon thereafter as practically possible and acidified immediately thereafter.

The EPA allows only 14 days holding time for mercury in plastic bottles for drinking water analysis.

Certain anions require special handling. Holding times and preservation for a particular sample will be determined by the requirement for the anion of interest with the shortest holding time; e.g., nitrate and nitrite - 48 hours; orthophosphate-filter and 48 hours.

11 Zinc acetate and NaOH to pH>9.

Table 2
Recommended Containers, Preservation, Storage, & Holding Times
For Soil, Solids, and Wastes

3		For 3011, 3011	us, and wastes			
Description	Method	Matrix	Sample Container	Preservative	Prep/Analysis Holding Time	Volume .
olatile/Semivolatile Analyses				79		
GC-Pu:geable	8021B	Soil/Waste	G (b) Tef Sep	See Memo 9	14 days	See Memo 9
GC/MS- Purgeables	8260C	Soil/Waste	G (b) Tef Sep	See Memo 9	14 days	See Memo <sup>9</sup>
GC-Pesticides & PCBs	8081A/8082	Soil/Waste	AG (a) Tef Cap	Cool 4º C	14/40 days <sup>3</sup>	100 g or 8 oz Jar
GC/MS-Semivolatiles – PAHs Base Neutral/Acid Extractable	8270C	Soil/Waste	AG (a) Tef Cap	Cool 4º C	14/40 days 3	100 g or 8 oz Jar
Petroleum Hydrocarbon Analy	yses .			1		Contractor 18
Oil & Grease	Modified 413.2	Soil	G (a) Tef Cap	Cool 4º C	14/40 days 3,4	100 g or 8 oz Jar
Total Recoverable Petroleum Hydrocarbons	Modified 418.1	Soil	G (a) Tef Cap	Cool 4° C	14/40 days 3.4	100 g or 8 oz Jar
Diesel Range Organics (DRO)	Modified 8015B	Soil	G (a) Tef Cap	Cool 4° C	14/40 days 3,4	100 g or 8 oz Jar
Gascline Range Organics (GRO)	Modified 8015B	Soil	G (b) Tef Sep	Cool 4° C 15 ml CH <sub>3</sub> OH	14.days	15 g <sup>2</sup>
Total Hydrocarbons by GC	Modified 8100	Soil	G (a) Tef Cap	Cool 4º C	14/40 days 3,4	100 g or 8 oz Jar
Total Hydrocarbons by GC	Florida Pro	Soil	G (a) Tef Cap	Cool 4° C	14/40 days <sup>3,4</sup>	100 g or 8 oz Jar
MA DEP EPH	98-1	Soil		See Tab	le 3	ir kartin
MA DEP VPH	97-12	Soil		See Tab	le 4	
CT DPH ETPH	8015B	Soil	+	See Tab	le 5	
Metal Analyses		-1				
Metals-AA	7000 Series	Soil	P or G (c)	Cool 40 C	6 months	100 g or 8 oz Jar
ICP Metals	6010B	Soil	P or G (c)	Cool 4º C	6 months	· 100 g or 8 oz Jar
Mercury	7471A	Soil	. P or G (c)	Cool 4º C	28 days	100 g or 8 oz Jar
Lead, Organic	CA LUFT	Soil	G (a) Tef Çap	Cool 4º C	Analyze immediately	200 g or 8 oz Jar
General Inorganie Analyses		+	-			
General Inorganics	9000 Series	Soil	P or G (c) 5	Cool 4º C	Not to exceed Table 1 specifications	100 g or 8 oz Jar
Asbestos (Bulk)	EPA Interim Method	Bulk	G (a) Tef Cap	None	Indefinite	50 g minimum

# Table 2 Recommended Containers, Preservation, Storage, & Holding Times For Soil, Solids, and Wastes

Description	Method	Matrix	Sample Container <sup>1</sup>	Preservative	Prep/Analysis Holding Time	Volume
BTU	ASTMD 240 SM 403	Soil	P or G	Cool 4º C	28 days	, 50 g
Flashpoint/Ignitability	1010	Soil	G (b) Tef Sep or G (a) Tef Cap	Cool 4°C	ASAP	100 g or 8 oz Jar <sup>6</sup>
pH/Co:rosivity	9040B 9045C	Soil/Waste	P or G	Cool 4°C	ASAP 7	100 g or 2 oz Jar <sup>2</sup>
Reactivity	SW 846 Section 7.3	Soil/Waste	P or G	Cool 4° C	ASAP 7	100 g or 8 oz Jar
Standard Plate Count	907C	Soil/Solid/ Waste	Sterile Plastic	Cool 4° C	24 hours	100 g
TCLP/SPLP	1311/1312	Soil/Waste	Inorganics - P or G (c) or (a) Organics - G (a)	Cool 4° C if appropriate	varies by method	500 g or 32oz Jar <sup>2,8</sup>
Total Organic Carbon (TOC)	9060	Soil	G (a) Tef Cap	Cool 4º C	. 28 days	100g or 8 oz Jar
Total Organic Halogens (TOX)	9020B	Soil	G (a) Tef Cap	Cool 4º C	14 days	100g or 8 oz Jar

#### Notes:

- G(x) = glass; AG(x) = amber glass; P(x) = plastic; Tef Sep = Teflon septum; Tef Cap = Teflon lined cap; x = cleaning protocol as follows: a = acid wash + solvent wash + oven dry; b = oven dry; c = acid wash.
- Fill completely to avoid volatile loss; if pre-weighted VOA vials are used, sample cannot exceed half volume of the vial.
- 3 Holding time is fourteen days from sample collection date for extraction, 40 days from extraction date for analysis of extract.
- EPA has not recommended oil and grease, petroleum hydrocarbons or EDB holding times in soil. The holding time is given by analogy to extractable organics.
- Acid washed containers are not appropriate for nitrate and other N analysis. Use glass container ordered with cleaning protocol (1-Chem V220-0250, or equivalent).
- Fill completely to avoid volatile loss. If vials are used, a minimum of 4 is required.
- Holding time is not to exceed 14 days. If sulfide reactivity is sought, then not to exceed 7 days.
- TCLR samples with liquid require more sample volume. For example, a sample with 10% solids requires a minimum of 2000g. Aqueous samples should routinely be provided as 3 liters in order to cover for breakage and provide enough sample for laboratory QC.
- Refer to Spectrum Analytical Memorandum (M-020) dated March 12, 1999.

Table 3
Recommended Containers, Preservation, Storage, & Holding Times
For MA DEP EPH Samples

Marrix	Container	Preservative	Holding Time
Aqueous	1 liter amber glass bottle with Teflon-lined screw cap	Add 5 ml of 1:1 HCl; Cool to 4° C	Samples must be extracted within 14 days and analyzed within 40 days
Soil/Sediment	4-oz (120 ml) wide mouth amber glass jar with Teflon- lined screw cap	Cool to 4° C	Samples must be extracted within 7 days and analyzed within 40 days

Table 4  Recommended Containers, Preservation, Storage, & Holding Times  For MA DEP VPH Samples				
Matrix	Container	Preservative	Holding Time	
Aqueous	2 - 40 ml VOA vials with Teflon-lined screw caps	Add 3 to 4 drops of 1:1 HCl; Cool to 4° C	14 days	
Soil/Sediment	2 - 40 ml VOA vials with	Add 15 g of soil to pre-weighed, laboratory preserved VOA vials on site; additional	28 days	

sample without preservative is needed to figure dry weight calculation; Cool to 40 C 28 days

Table 5
Recommended Containers, Preservation, Storage, & Holding Times
For CT DPH ETPH Samples

Matrix	Container	Preservative	Holding Time
Concentrated Waste Sample	125 ml wide mouth glass container with Teflon lined lid	None	Samples must be extracted within 14 days and analyzed within 40 days
Water Samples with No Residual Chlorine Present	1 L amber glass containers with Teflon lined lids	Add 3 to 4 drops of 1:1 HCl; Cool to 4° C	Samples must be extracted within 7 days and analyzed within 40 days
Water Samples with Residual Chlorine Present	1 L amber glass containers with Teflon lined lids	Add 3 ml 10% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution per gallon. Add 3 to 4 drops of 1:1 HCl; Cool to 4 <sup>6</sup> C*	Samples must be extracted within 7 days and analyzed within 40 days
Soil/Sediment and Sludge	250mL wide mouth glass container with Teflon lined lid	Cool to 4° C	Samples must be extracted within 14 days and analyzed within 40 days

<sup>\*</sup> Dechlorination must be performed prior to the addition of any necessary preservative.

Soil/Sediment

Teflon-lined screw caps



#### Memorandum

(M-137)

To:

All Spectrum Analytical Clientele

From:

Sample Department

Date:

January 28, 1998

Subject:

Connecticut DEP TPH/GC Method

The following details sample collection, preservation, and handling guidelines for the Connecticut DEP Method, The Analysis of Total Petroleum Hydrocarbons Using Methylene Chloride Extraction and Gas Chromatograph/Flame Ionization Detection as prepared by the Environmental Research Institute of the University of Connecticut, September, 1997.

R	lecommended Containers, Preserv For CT DEP T		ling Times
Matrix	Container	Preservative	Holding Time
Concentrated Waste Sample	125mL wide-mouth glass container with Teflon lined lid	None	Samples must be extracted within 14 days and analyzed within 40 days
Water Samples with No Residual Chlorine Present	1 gal or 4 - 1 L amber glass containers with Teflon-lined lids	Cool to 4° C	Samples must be extracted within 7 days and analyzed within 40 days
Water Samples with Residual Chlorine Present	1 gal or 4 - 1 L amber glass containers with Tellon-lined lids	Add 3 ml 10% Na <sub>2</sub> S <sub>2</sub> 0 <sub>3</sub> solution per gallon. Cool to 4°C	Samples must be extracted within 7 days and analyzed within 40 days
Soil/Sediment and Sludge	250mL wide mouth glass container with Teflon-lined lid	Cool to 4° C	Samples must be extracted within 14 days and analyzed within 40 days

#### ENVIRONMENTAL ANALYSES



#### Memorandum

(M-020)

#### Important! Please copy and distribute to all Project Managers and Samplers!

To:

All Spectrum Analytical Clientele

From:

Sample Department March 12, 1999

Date: Subject:

New Sample Collection Techniques for VOC Soils

The following details Spectrum Analytical's policy regarding the collection, preservation, and handling of soil samples submitted for Volatile Organic Compounds (VOCs). These guidelines are in accordance with SW846 Method 5035 for Volatile Organics in Soil and Waste Samples. The Massachusetts Department of Environmental Protection beginning March 15, 1999 will strictly enforce these guidelines. Data for soil samples not properly preserved in accordance with specified guidelines will be rejected by the MA DEP.

The accurate sample collection technique depends on the expected concentration of VOCs in the sample. Techniques are group by three categories of sample types: low VOC concentration, high VOC concentration and oily waste samples.

#### Low concentration soil samples (< 200 µg/Kg or < .2 mg/Kg)

- All samples must be collected in a manner that minimizes sample handling and agitation.
- Samples must be collected in 20ml VOA vials containing 5ml of sodium bisulfate solution provided by Spectrum Analytical.
- During collection approximately 5 grams of soil must be added to the pre-measured, preweighed sodium bisulfate vial. All sediment must be removed from the glass threads of the vial to ensure an adequate seal.
- 4. Store samples on ice at 4°C until transport to the laboratory facility.
- Samples should always be collected in duplicate to cover for breakage and or laboratory quality control reanalysis.

#### ENVIRONMENTAL ANALYSES

 In addition, a third VOA vial (40ml) must be collected for screening, dry weight determination and high concentration analysis (if necessary). This third vial must not contain any sample preservation solution.

#### High concentration soil samples (> 200 µg/Kg or > .2 mg/Kg)

- 1. All samples must be collected in a manner that minimizes sample handling and agitation.
- Samples must be collected in 40ml VOA vials containing 15ml of purge and trap grade methanol provided by Spectrum Analytical.
- During collection approximately 10-15 grams of soil must be added to the pre-measured, preweighed methanol vial. All sediment must be removed from the glass threads of the vial to ensure an adequate seal.
- 4. Store samples on ice at 4°C until transport to the laboratory facility.
- Samples should always be collected in duplicate to cover for breakage and or laboratory quality control reanalysis.
- In addition, a third VOA vial (40ml) must be collected for screening and dry weight determination. This third vial must not contain any sample preservation solution.

#### Oily waste samples

The collection of oily samples depends on knowledge of the waste and its solubility in methanol.

- If the oily waste is known to be soluble in methanol, collect the sample in accordance with the technique noted for high concentration soils.
- 2. If the solubility of the oily waste is not known, the sample should either be collected in a vial without a preservative filling the container as full as possible in order to minimize volatile loss in the headspace, or test the solubility of a trial sample in the field. If the trial sample is soluble in methanol, collect the sample in accordance with the technique noted above for high concentration soils. Otherwise, collect an unpreserved sample as described above.

In order to alleviate uncertainties regarding which sample collection technique to use, Spectrum Analytical recommends the collection of all soil samples in accordance with both low and high concentration techniques. Please make certain to submit an additional VOA vial without any sample preservation solution for screening and dry weight determination.

The aforementioned sample containers are immediately available upon request from the laboratory. Be advised to clearly note which preservative is needed when requesting containers, otherwise HCl preserved VOA vials will be provided if no preservative is specified.



#### Memorandum

(M-017)

To:

All Spectrum Analytical Clientele

From:

Sample Department

Date:

March 2, 1999

Subject:

Sample Collection, Preservation and Handling

#### Collection of Samples in Duplicate

The collection of a sample in duplicate is requested when submitting a series of five or more samples per Chain of Custody. Collecting double the volume of a sample will enable us to perform additional quality control procedures in the laboratory. This practice may also be utilized when submitting samples for a project requiring additional quality control information.

#### Dechlorination of Samples

Clients are urged to carefully follow all preservation guidelines as specified in each applicable method. It has been brought to our attention that government agencies are strictly enforcing these guidelines including sample dechlorination. If residual chlorine is present in a sample, follow the instructions outlined below. Pay close attention to the order in which reagents are added to the sample. A brief synopsis of dechlorinating reagents by method is given for your referenced.

#### EPA 524.2

Add 25 mg of ascorbic acid to sample vials before filling. After the vial is filled to overflow, then add one drop of 1:1 HCl for each 20 ml of sample volume. Seal the vial taking care not to trap any air bubbles. Turn vial septa-face down, and shake vigorously for 1 minute. Collect samples in duplicate 40 ml VOA vials.

#### EPA 502.2

Add 25 mg of ascorbic acid or 3 mg of sodium thiosulfate to sample vials before filling. After the vial is filled to overflow, then add one drop of 1:1 HCl for each 20 ml of sample volume. Seal the vial taking care not to trap any air bubbles. Turn vial septa-face down, and shake vigorously for 1 minute. Collect samples in duplicate 40 ml VOA vials.

#### ENVIRONMENTAL ANALYSES

#### EPA 504.1

Add 3 mg of sodium thiosulfate crystals or 75 µl of sodium thiosulfate solution to sample vials before filling. Seal the vial taking care not to trap any air bubbles. The addition of acid to sample vials is not recommended. Collect samples in duplicate 40ml VOA vials.

#### **EPA 608**

If necessary, samples should be adjusted to a pH range of 5.0 to 9.0 with sodium hydroxide or sulfuric acid. If aldrin is to be determined, add sodium thiosulfate when residual chlorine is present. Collect samples in 1 liter glass containers.

#### EPA 625

If residual chlorine is present, add 80mg of sodium thiosulfate per each liter of water. Collect samples in 1 liter amber glass containers.

The EPA recommends the use of sodium thiosulfate as the dechlorinating reagent in the event that a method allows the use of more than one dechlorinating reagent. One exception to this recommendation is ascorbic acid must be used when vinyl chloride and other gases are measured with a mass spectrometer.

The aforementioned reagents are available from the laboratory. Upon request, VOA vials containing the pre-measured amount of reagent as specified in the method may be supplied. A separate vial containing HCl will be provided for final pH adjustment to <2 when applicable. Be advised to clearly note this requirement when requesting containers, otherwise, HCl preserved VOA vials will be provided.

#### Cooling of Samples

Samples must be chilled to 4°C immediately following collection and packed with a sufficient amount of ice to maintain that temperature until receipt at laboratory facility. EPA protocols do not allow the use of icepacks or ice substitutes because they are unable to reach a cold enough temperature.

Laboratories are required to maintain a record of sample temperature as received. In the event that no temperature blank is submitted with the sample(s), an observation must be made as to whether the sample(s) is cold or ambient upon receipt. A notation of the observed temperature is made on the duplicate of the Chain of Custody for our records. Samples received on ice will be noted as such. Where upon samples are transferred from a refrigerator, the temperature will be recorded as cold and refrigerated.

#### Sample Integrity

Spectrum Analytical is committed to maintaining the integrity of all samples submitted for laboratory analyses. Spectrum has a set criterion that all samples must pass in order to be considered to be of satisfactory condition. The Sample Department will notify the client via facsimile of any samples that may be considered to be of unsatisfactory condition. Analysis of unsatisfactory samples will be conducted only with the written authorization from the client.



The following details Spectrum's policy regarding collection, preservation and handling of all samples that are submitted for VPH and/or EPH analysis. These guidelines are in accordance with Massachusetts DEP Method for the determination of Volatile (VPH) and Extractable (EPH) Petroleum Hydrocarbons, January 1998.

#### Sample Collection, Preservation, and Handling for VPH Method

All samples must be cooled to 4 degrees (Celsius) immediately after collection.

A Chain of Custody must accompany all samples submitted for analysis, documenting the time and date of sampling and any preservative addition.

A summary of sample collection, preservation and holding times is provided in Table 1.

#### Aqueous Samples

- Aqueous samples should be collected in duplicate without agitation and without headspace in contaminate-free, HCl preserved, 40ml VOA vial with Teflon-lined septa screw caps. The Teflon liner must come in contact with the sample.
- 2. The laboratory must determine the pH of all water samples unless the laboratory (this must be noted on the Chain of Custody) supplied the sample vials containing acid for field preservation. The pH measurement may be performed on leftover sample. Any sample found to have a pH above 2.0 must be so noted on the laboratory/data report sheet.
- A reagent trip blank should accompany each batch of water samples.
- 4. Aqueous samples must be analyzed within 14 days of collection.

#### Soil Samples

 Soil samples must be collected in a manner that minimizes sample handling and agitation. Samples must be in a Methanol-preserved 40ml VOA vial that is provided by Spectrum. All sediment must be removed from the glass threads of the vial to ensure an adequate seal.

#### ENVIRONMENTAL ANALYSES

- Methanol preservation of soil samples is mandatory. Methanol (purge and trap grade) must be added to the sample vial before or immediately after sample collection. Spectrum will provide pre-weighed 40ml VOA vials containing 15 ml of purge and trap grade Methanol for in-field preservation of VPH samples. In lieu of in-field preservation with methanol, soil samples may be obtained in specially-designed, air-tight sampling devices provided that the samples are extruded and preserved in methanol within 48 hours of collection. Additional details and recommendations on soil sampling are provided in Appendix 4.
- During collection, approximately 15 grams (+/- 25%) of soil must be added to exactly 15ml of Methanol. This may be accomplished visually by adding soil until the layer of soil is approximately equal or just less than the layer of preservative. In all cases, the soil sample in the vial must be completely covered by methanol.
- 4. Samples for VPH analysis should be collected in duplicate 40ml vials. An additional sample of soil should also be obtained (without Methanol) to allow for a determination of soil moisture content and VPH dry weight correction factors. (Remaining soil from EPH method will be sufficient to calculate soil moisture content if applicable).
- 5. A Methanol trip blank should accompany each batch of samples.
- 6. Observations of vial leakage must be so noted on the laboratory/data report sheet.
- 7. Soil and sediment samples must be analyzed within 28 days of collection.

	TAB HOLDING TIMES A	LE 1 ND PRESERVATIVES SAMPLES	C.
Matrix	Container	Preservation	Holding Times
Aqueous Samples	2-40ml VOC vials with Teflon-lined septa screw caps	Add 3 to 4 drops of 1:1 HCl; cool to 4°C	14 days
Soil/Sediment Samples	2 VOC vials with Teflon- lined septa screw caps. 40-ml vials: add 15g soil	1 ml methanol for every g soil; add before or at time of sampling, cool to 4°C	28 days

#### Sample Collection, Preservation and Handling for EPH Method

All samples must be cooled to 4 degrees (Celsius) immediately after collection.

A Chain of Custody must accompany all samples that are submitted for analysis documenting the time and date of sampling and any preservative addition.

A summary of sample collection, preservation and holding times is provided in Table 2.

#### Aqueous Samples

- Aqueous samples are collected in HCl preserved 1 liter amber glass bottles with Teflonlined screw caps.
- Aqueous samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.

#### Soil Samples

- Soil and sediment samples are collected in 4-oz amber glass jars with Teflon-lined screw caps.
- Soil and sediment samples must be extracted within 7 days of collection, and analyzed within 40 days of extractions.

# TABLE 2 HOLDING TIMES AND PRESERVATIVES FOR EPH SAMPLES

Matrix	Container	Preservation	Holding Times
Aqueous Samples	1-Liter amber glass bottle with Teflon-lined screw cap	Add 5 ml of 1:1 HCl; cool to 4° C	Samples must be extracted within 14 days and extracts analyzed within 40 days
Soil/Sediment Samples	4-oz. (120mL) wide mouth amber glass jar with Teflon-lined screw cap.	Cool to 4° C	Samples must be extracted within 7 days and extracts analyzed within 40 days

# APPENDIX 4 Collecting and Preserving VPH Soil Samples Page 1 of 3

OPTION 1: In-Field Methanol Preservation Technique

PERFORMANCE STANDARD: Obtain undisturbed soil sample and preserved with methanol at a

ration of 1 mL methanol per 1 gram soil.

Step 1: Choose appropriate sampling container:

60 mL wide mouth packer bottle; or 60 mL straight sided wide mouth bottle; or

60 mL VOA vial; or 40 mL VOA vial

All sampling containers should have an open-top screw cap with Teflon-coated silicone rubber septa or equivalent.

 Label each container with a unique alpha/numerical designation. Obtain and record tare (empty) weight of each container to nearest 0.1 gram. This information must be available

to the laboratory performing the analyses.

Add 25 mLs of purge and trap grade methanol to 60 mL containers, or 15 mL to 40 mL containers. It is essential that the methanol be purge and trap grade or equivalent quality. Immediately cap the container. Make a mark on the 650 mL containers approximately 15 mL above the level of methanol, or a mark on the 40 mL container approximately 10 mL above the level of methanol. The objective is to obtain 25 grams of soil in the 60 mL containers, or 15 grams of soil in the 40 mL container, which is approximately 15 to 10 mL of soil volume, respectively, depending upon soil type and moisture content. Store at 4°C. The use of methanol trip blank prepared in this manner is recommended.

In the field, carefully add soil to the sample container, until the level of methanol in the vial reaches the designated volumetric mark. For wet soil, add slightly beyond the mark. IN . NO CASE, HOWEVER, MAY THE LEVEL OF SOIL IN THE CONTAINER RISE ABOVE THE LEVEL OF METHANOL. The use of a 10-30 mL disposal syringe with the end cut off is recommended to obtain an undisturbed soil sample from freshly exposed soils. In such cases, obtain and extrude the soil into sample container, avoiding splashing methanol out of the container.

Optional: use a field electronic balance to ensure addition of desired mass of soil (25 grams to 60 mL containers, 15 grams to 40 mL containers).

Use a clean brush or paper towel to remove soil particles from the threads of the sample container and screw cap. Tightly apply and secure screw cap. Gently swirl sample to break up soil aggregate, if necessary, until soil is covered with methanol. DO NOT SHAKE. Duplicate sample obtained in this manner are recommended. A split-sample must also be obtained for a determination of soil moisture content. This sample must NOT be preserved in methanol. HINT: fill this container ½ full, to allow screening of the sample headspace by the field investigator or the laboratory.

Immediately place containers in cooler for storage in an upright position. Sample containers can be placed in separate zip-lock bags to protect containers in case of leakage during transport. Transport to analytical laboratory using appropriate chain of custody procedures and forms.

Step 2:

Step 3:

Step 4:

Step 5:

Step 6:

# APPENDIX 4 Collecting and Preserving VPH Soil Samples Page 2 of 3

OPTION 2: Use of a Sealed-Tube Sampling/Storage Device

PERFORMANCE STANDARD: Obtain undisturbed soil sample and immedately seal in air-tight

container,, for shipment to laboratory and immersion in methanol

within 48 hours.

Step 1: Obtain pre-cleaned and/or disposable samplers/containers that allow the collection and air-

tight storage of at least 15 grams of soil.

Step 2: In the field, obtain an undisturbed sample from a freshly exposed soil. Immediately seal

container and place in a cooler. Obtains duplicate sample to enable the determination of soil moisture content (this does not need to be in a sealed sampler/container). Transport to

analytical laboratory using appropriate chain of custody procedures and forms.

Step 3: Samples must be extruded and immersed in purge and trap (or equivalent) grade methanol

at the laboratory within 48 hours of sampling, at a ration of 1 mL methanol to 1 gram soil. In no case, however, shall the level of soil in the laboratory container exceed the level of

methanol (i.e., the soil must be completely immersed in methanol).

NOTE: Documentation MUST be provided/available on the ability of the

sampler/container to provide an air-tight seal in a manner that results in no statistically significant loss of volatile hydrocarbons for at least 48 hours. To date, only one

commercially available product, the En Core Sampler, has provided this level of

demonstration.

OPTION 3: Use of Alternative Collection/Storage/Preservation Techniques

PERFORMANCE STANDARD: Obtain and store an undisturbed soil sample in a manner that

ensures the chemical integrity of the sample by: (1) preventing the volatilization of petroleum hydrocarbons heavier than C5; and,

(2) preventing the biological degradation of petroleum

hydrocarbons.

NOTE: The onus is on the user of such techniques to demonstrate the

validity of the procedures used, via reference to published literature

and/or other pertinent data.

#### SAFETY

Methanol is a toxic and flammable liquid, and must be handled with appropriate care. Use in a sell-vented area, and avoid inhaling methanol vapors. The use of protective gloves is recommended when handling or transferring methanol. Vials of methanol should always be stored in a cooler with ice at all times, away from sources of ignition such as extreme heat or open flames.

#### APPENDIX 4 Shipping Methanol Preserved Samples Page 3 of 3

#### Shipping of Hazardous Materials

Methanol is considered a hazardous material by the US Department of Transportation (DOT) and the International Air Transport Association (IATA). Shipments of methanol between the field and the laboratory must conform to the rules established in Title 49 of the Code of Federal Regulations (49 CFR parts 171 to 179), and the most current edition of the IATA Dangerous Goods Regulations. Consult these documents or your shipping company for complete details.

#### Small Quantity Exemption

The volumes of methanol recommended in the VPH method fall under the small quantity exemption of 49 CFR section 173.4. To qualify for this exemption, all of the following must be met:

- the maximum volume of methanol in each sample container must not exceed 30 mL
- the sample container must not be full of methanol
- the sample container must be securely packed and cushioned in an upright position, and be surrounded by a sorbent material capable of absorbing spills from leaks or breakage of sample containers.
- the package weight must not exceed 64 pounds
- the volume of methanol per shipping container must not exceed 500 mL
- the packaging and shipping container must be strong enough to hold up to the intended use
- the shipper must mark the shipping container in accordance with shipping dangerous goods in acceptable quantities, and provide the statement:

"This package conforms to conditions and limitations specified in 49 CFR 173.4"

#### Shipping Papers

All shipments must be accompanied by shipping papers which include the following:

Proper Shipping Name:

Methyl Alcohol

Hazardous Class:

Flammable Liquid

Identification Number:

UN1230

Total Quantity:

(mL methanol/container x the number of containers)

Emergency Response Info:

Methanol MSDS attached

Emergency Response Phone:

Provide appropriate number

Shipping Exemption:

DOT-E 173.118, Limited Quantity

#### Labeling & Placarding

Labeling and placarding is not required for valid small quantity exemptions (per 173.118)

# GROUNDWATER SAMPLE COLLECTION PROCEDURES USING BAILERS OR PUMPS

The following groundwater sampling protocols are based on standard methods found in ASTM Designation: D4448-85a, USEPA guidance documents (numerous references), and Massachusetts DEP "Standard References for Monitoring Wells" (WSC-310-91).

#### 1. MATERIALS

The following equipment and materials may be used during groundwater sampling. Not all material and equipment is necessary all of the time.

- health and safety equipment;
- map of well locations;
- well keys;
- interface probe;
- · electronic water level indicator;
- PID or FID:
- pH, conductivity, and temperature meters; or a water quality monitoring system (pH, conductivity, temperature, ORP, and optional dissolved oxygen);
- field book;
- disposable gloves;
- stainless-steel, Teflon ™ or PVC, bailers with Teflon check valves;
- · dedicated polypropylene cord;
- bucket (calibrated in gallons);
- sample containers and labels;
- chain-of-custody forms;
- cooler and cold source;
- decontamination equipment;
- · polyethylene sheeting;
- · polyethylene tubing and check valve;
- field filtering apparatus.

Pre-decontaminated bailers will be wrapped in an inert material (i.e. plastic bags) and stored in a clean environment during transport to the Site (See Decontamination Procedures).

In order to ensure the collection of groundwater samples representative of the aquifer, the standing water within the well is first purged. Note: Depth to water level measurements will be performed in each monitoring well prior to purging and sampling (see Water-Level Measurement Procedures).

#### 2.0 WELL PURGING

- An interface probe or electronic water level indicator will be lowered to the air-water interface and the depth to water and depth of the well will be recorded. If the presence of a free phase product (light non-aqueous phase liquid - LNAPL) is suspected, an interface probe will be lowered to the product-water interface and the thickness of the product will be measured. Depth of the well will not be measured if LNAPL is present.
- · If no free phase product is present in the well purging will begin:
  - Groundwater will be purged from the well using a decontaminated stainless-steel or PVC bottom-emptying bailer equipped with a Teflon™ check valve, or a noncontaminating water pump.
  - Groundwater collected during purging and sampling of groundwater monitoring wells
    will be discharged to the subsurface at the point of withdrawal in accordance with
    Massachusetts General Law Chapter 21E and 310 CMR 40.0056 of the Massachusetts
    Contingency Plan. If purge water is grossly contaminated (i.e. contains free phase
    product) this water will be drummed and disposed of according to applicable municipal,
    state, and federal regulations (See Disposal Procedures).
  - When using a pump, clean, dedicated polyethylene tubing will be used for each well. In appropriate situations, the polyethylene tubing can be stored in the well casing for use during future sampling events.
  - When using dedicated stainless-steel, PVC, or Teflon™ bailers to purge the wells, a separate pre-decontaminated bailer will be used for each well.
  - The bailer will be suspended with disposable/dedicated polypropylene cord. Care will be taken that the cord does not touch the ground during sampling and purging. The cord will be discarded upon completion of each well sampling event.
  - Non-dedicated bailers will be decontaminated in the field between each well sampling event according to Decontamination Procedures.
  - One of the following procedures will be used to determine if the purging is complete:
    - A. The efficiency of purging will be verified by measuring changes in the temperature, pH, and specific conductance (in-situ parameters) of well water during purging. The stabilization of pH, temperature, and conductivity readings for two consecutive measurements, indicates that "stagnant water" has been removed from the well and that aquifer formation water (groundwater) is now entering the well. Stabilization will be defined as the following; The pH measurements should be to within ± 0.1 pH unit, the temperature to within ± 1.0°C, and specific conductance to within ± 10 umhos/cm for two consecutive readings.

- B. An alternative method for determining if purging is complete may be used where the use of this method meets the assessment objectives. In this case, the well will be pumped or bailed until a specified volume of water has been removed from the well, commonly a minimum of 3 to 5 well bore volumes. In wells screened within low permeability formations, the well may go "dry" prior to the removal of 3 to 5 volumes. Purging is considered complete in this case. However, the complete draining of a well will be avoided if possible during the purging process because of the potential loss of volatiles.
- For complete purging of "stagnant water" (using either a pump or a bailer) the removal
  of well water will occur from just below the air-water interface in the well. In some
  situations, when using a pump, the pump intake may be lowered to remain just below
  the water surface as pumping is in progress. If the well screen is 20 feet or longer,
  groundwater will be pumped or bailed from the mid-point of the screen.
- The temperature, conductivity, and pH of the first well volume will be recorded using
  individual pH, conductivity, and temperature meters or a water quality monitoring
  system. These parameters may be measured following the removal of each subsequent
  well volume. If specified, oxidation reduction potential will also be recorded.
- The volume of purge water will be measured by pumping or bailing groundwater directly into a container of known volume.
- When using a pump for purging, a water quality monitoring system can be connected to the pump discharge in order to monitor the in-situ parameters. In-situ parameters may be alternatively monitored in a beaker filled from the bailer or the pump discharge.
- When bailing, care will be taken to assure that the bailer cord is held in the hand or
  placed upon plastic surrounding the well to prevent the potential of cross contamination
  from the ground surface to the well.
- The volume of water purged from the well, the measurements of temperature, pH, and specific conductivity, and observations of color, odor, and turbidity will be recorded on a sampling log. An example of the ECS Groundwater Sampling Log is attached.
- All measuring equipment will be decontaminated between uses (See Decontamination Protocols). The groundwater measuring equipment will be calibrated daily prior to use and in the field if field personnel suspect a problem with the calibration.

 When using dedicated bailers, the stainless-steel bailers will be rinsed with clean potable water following sample collection and placed in a plastic bag for transport to the company's facility where decontamination will take place (See Decontamination Procedures).

#### 3.0 GROUNDWATER SAMPLING PROTOCOL

- Water samples for the analysis of volatile organic compounds (VOCs) (including volatile
  petroleum hydrocarbons) will be collected as soon as the well has sufficiently recovered
  from purging and within three hours of purging. Samples for the analysis for VOCs will be
  collected from the first volume of water collected from the top of the water column in the
  well.
- Groundwater samples collected for the analysis of VOCs will be collected in duplicate 40-milliliter glass vials with zero headspace. Vials will be pre-preserved with hydrochloric acid to a pH of <2. The vial will be uncapped carefully in order to avoid contact with the Teflon septum. The vial will be filled slowly taking care to not to agitate the sample when transferring it from the bailer to the sample vial. Each vial will be filled until there is a meniscus over the lip of the vial. If no meniscus forms, a sample of water will be collected in the cap and poured slowly into the vial to create a meniscus. The Teflon-faced septum will be placed on the convex meniscus and the cap screwed down. The vial will be inverted and tapped to check for the presence of air bubbles. If air bubbles are present, the sample will be discarded and another vial will be selected and filled.</p>
- Groundwater samples for analysis for PCBs, pesticides, total and extractable petroleum hydrocarbons, semivolatiles organic compounds, metals, other inorganic compounds, and general chemical parameters, will be collected last. Assuming adequate recharge, all samples will be collected within 3 hours of purging or upon 90% recovery.
- Groundwater samples for the analysis for dissolved (soluble) metals will be collected by
  using HDPE tubing with a decontaminated checkvalve and an in-line dedicated 0.45 micron
  filter. Care will be taken to pump the sample with very gentle pressure, in order to avoid
  any potential failure of the cartridge filter. The sample will be collected directly in a 1-liter
  HDPE bottle pre-preserved with nitric acid to achieve a pH <2.</li>
- The sample containers for groundwater samples collected for all analyses other than VOCs will be filled to 90% capacity. Care will be taken so that no portion of the sample comes in contact with the sampler's gloves. ECS Standard Operating Procedure (SOP) # 4.00 should be referenced for selection of proper sample containers and preservation methods for each analytical method.
- Duplicate samples, field blanks, and equipment rinsate blanks will be collected according to specified QA/QC frequency

- A trip blank consisting of deionized hydrocarbon-free laboratory water in a 40-milliliter Teflon-septum vial, prepared prior to sampling, will be present with the volatile samples at all times during sampling and transportation to the analytical laboratory, and will be subjected to the same analyses as the samples.
- All sample containers will be capped immediately after filling. The exterior of the
  container will be rinsed with deionized water and dried with paper towels. Samples will be
  cooled to 4°C by placing them immediately in a chilled, thermally insulated container with
  a cold source;
- All sample containers will be labeled immediately upon collection with the following information: site; project number; well number; date; time of collection; testing parameters; initials of sampling personnel.
- All equipment used to collect samples for analysis will be either decontaminated before each use or dedicated to a particular sample location after initial decontamination.
- Based on the results of previous sampling and analysis, sampling will progress from the least contaminated well to the most contaminated well.
- All groundwater samples will be immediately placed in a chilled, thermally-insulated container and submitted as soon as possible to a Massachusetts-certified analytical laboratory under Chain of Custody protocol. Information regarding sample holding times is found in Table 1. Information regarding Chain of Custody protocol is found in the Sample Custody Procedure.

# GROUNDWATER SAMPLE COLLECTION PROCEDURES USING AN EARTHPROBE™ ≈

Groundwater samples will be collected by using a truck-mounted, hydraulically driven probe drive system (Earthprobe<sup>TM</sup>) to drive a mill-slotted well point to a position below the water table. The groundwater samples will be collected by using a length of dedicated polyethylene tubing equipped with a check-valve, which when oscillated, will pump groundwater up into the tubing and to the surface or by attaching a vacuum pump to the polyethylene tubing to pump the water to the surface.

#### 1.0 MATERIALS

The following materials will be available during groundwater sampling:

- · health and safety equipment;
- YSI Water Quality Monitoring System (pH, conductivity, temperature, and ORP) or equivalent instruments;
- · field book;
- disposable gloves;
- · Earthprobe;
- Mill-slotted well point;
- Electronic water level indicator;
- dedicated 0.25-inch ID polyethylene tubing;
- stainless steel bottom check valves;
- Geoprobe<sup>™</sup> AT-100 portable vacuum pump;
- bucket (calibrated in gallons);
- sample containers and labels;
- chain-of-custody forms;
- · cooler and cold source;
- decontamination equipment.

#### 2.0 PROCEDURES

A decontaminated 36-inch, 1.0-inch outside diameter, alloy steel, temporary well point with a 24-inch 0.76-inch inside diameter 0.020 mill-slotted screen will be driven to a position below the water table at the depth of interest.

If soil sampling is performed prior to groundwater sample collecting, the soil sampler will be first removed from the borehole. A decontaminated 36-inch, 1.0-inch outside diameter, alloy steel, temporary well point with a 24-inch 0.76-inch inside diameter 0.020 mill-slotted screen will

be lowered into the hole if the borehole remains open or driven to a position below the water table at a depth of interest.

A decontaminated electronic water level indicator will be lowered through the probe rods to the air-water interface and the depth to water will be recorded.

A dedicated length of 0.25-inch inside diameter polypropylene tubing will be inserted through the probe rods to the depth of the well screen.

The temperature, conductivity, and pH of the first well volume will be recorded using the appropriate instruments. Protocols for these instruments are found in the procedures for field analysis. These parameters will be measured following the removal of each subsequent probe rod volume. The temporary well will be purged of at least three probe rod volumes if possible.

As soon as the well has sufficiently recovered from purging and within three hours of purging, groundwater samples will be collected directly from the end of the tubing according to groundwater sampling protocols.

## 2.10 - Groundwater Sampling Protocol using Polyethylene Tubing and Checkvalve.

A dedicated length of 0.25-inch inside diameter polypropylene tubing equipped with a stainless steel check valve will be inserted through the probe rods to the depth of the well screen. The tubing will be oscillated up and down in order to pump the groundwater to the surface.

# 2.20 - Groundwater Sampling Protocol using Polyethylene Tubing and a Portable Vacuum Pump

A dedicated length of 0.25-inch inside diameter polypropylene tubing will be inserted through the probe rods to the depth of the well screen. The tubing will be connected to a portable vacuum pump.

A portable vacuum pump (Geoprobe™ Model AT-100) will used to pump the groundwater from below the water table to the surface.

The water sample will collected directly from the tubing into a sample flask which is separated from the vacuum pump by a vacuum chamber and valve (see attached Figure). The collection of the groundwater sample in this manner, through the sample flask, allows for the separation of the air/water interface. This collection method is therefore acceptable for the collection of groundwater samples that are to be analyzed for volatile organic compounds.

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Following purging of the temporary well, groundwater is pumped through the sample flask and the vacuum chamber through a valve, and into glass jar with a washer which is connected to the vacuum pump. The valve between the glass jar and the sample flask is then closed. Air is removed from the sample assembly by rotating the sample assembly. The valve is then opened so that all remaining air is drawn off.

Pumping continues until the glass jar is filled. The valve is then closed. The glass cap of the sample flask is then removed and the sample collected directly from the glass flask.

If there is silt in the sample, the flask should be allowed to sit until most of the silt settles to the bottom of the sample flask. The sample will then be decanted from the flask when collected.

# GROUNDWATER SAMPLE COLLECTION PROCEDURES USING LOW FLOW SAMPLING METHODOLOGY

The following groundwater sampling protocols are based on the USEPA Region 1 Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells (July 30, 1996, Revision 2) (Region 1 Low Flow SOP #: GW 0001) with the following modifications.

#### 1.0 MATERIALS

The following equipment and materials may be used during groundwater sampling. Not all material and equipment is necessary all of the time.

- health and safety equipment;
- map of well locations;
- well construction data;
- · field data from last sampling and/or gauging event;
- · well keys;
- · interface probe;
- · electronic water level indicator;
- · PID or FID;
- a multiprobe water quality monitoring system (pH, specific conductivity, temperature, ORP, and optional dissolved oxygen)-i.e. Geotech Multiprobe Sampling System™ or YSI Model 3560 Water Quality Monitoring System™
- field book;
- · adjustable rate peristaltic pump;
- 3/16-inch inside diameter and ¼-inch outside diameter polyethylene tubing;
- ¼-inch inside diameter silicone tubing;
- · cable ties;
- folding table;
- disposable gloves;
- bucket (calibrated in gallons);
- sample containers and labels;
- · chain-of-custody forms;
- cooler and ice;
- decontamination equipment;
- polyethylene sheeting;
- field filtering apparatus.

In order to ensure the collection of groundwater samples representative of the aquifer, the standing water within the well is first purged. Note: Depth to water level measurements will be performed in each monitoring well prior to purging and sampling (see Water-Level Measurement Procedures).

#### 2.0 WELL PURGING

An electronic water level indicator will be lowered slowly to the air-water interface and the depth to water will be recorded. Care should be taken such that any particulates in the water column are not mobilized. Depth of the well should be based on previous sampling logs or measurements made after the collection of the groundwater sample. If the presence of a free phase product (light non-aqueous phase liquid - LNAPL) is suspected, an interface probe will be lowered to the product-water interface and the thickness of the product will be measured. If LNAPL is present, the well will not be sampled using the low flow sampling procedure.

- · If no free phase product is present in the well purging will begin.
  - Purging of each well prior to sampling is conducted using an adjustable rate peristaltic
    pump in line with a multiprobe water quality monitoring system. This instrument
    allows for the visual monitoring of five parameters (temperature, pH, specific
    conductivity, dissolved oxygen and Eh -- oxidation-reduction potential)
    simultaneously in real time. This system uses an adjustable rate peristaltic pump
    system to collect the purge water directly into a flow-through chamber assembly
    containing the parameter probes.
  - A dedicated polyethylene tubing of 3/16-inch inside diameter and ¼-inch outside diameter is tied flush with the tip of a water-level measurement indicator using a plastic cable tie and is lowered into the well casing until it is at the mid-point of the saturated screen length and at least 2 feet from the bottom of the well.
  - A dedicated section, approximately one foot long, of ¼-inch inside diameter silicone
    tubing is fit through the peristaltic pump. The silicone tubing connects the dedicated
    polyethylene tubing from the well to a small piece of polyethylene tubing
    (approximately 24-inch), which attaches to the flow-through chamber of the
    multiprobe water quality monitoring system.
  - The pump is started at its lowest speed setting and slowly increased until the purge water is directly discharged into the chamber. Once the chamber is filled with purge water, the multiprobe meter displays are turned on and the initial stabilization parameter measurements should be recorded. The volume of purge water will be measured by pumping groundwater directly into a container of known volume.
  - The pumping rate is adjusted until there is little or no water level drawdown. Any
    adjustments made should be recorded. During the initial pump start-up, the drawdown
    may exceed 0.3 feet as pump flow adjustments are made and the water level stabilizes.
    If the minimal drawdown possible exceeds 0.3 feet but remains stable, continue purging
    at the stabilized groundwater drawdown level.
  - If drawdown exceeds 0.3 feet and does not stabilize, sampling should proceed.
  - The water level inside the well casing is monitored every three to five minutes or approximately every 0.25 to 0.5 gallons during purging. Drawdown of less than 0.3 feet

during purging is desirable but not mandatory. The volume of water purged from the well, field measurement data (temperature, pH, specific conductance, ORP/Eh and dissolved oxygen if available) along with observations of color, odor and turbidity are recorded during the purging process every three to five minutes or as appropriate. An example of the ECS Low Flow Groundwater Sampling Log is attached.

- Purging is complete when stabilization of the groundwater parameters has been reached
  and the volume purged exceeds the stabilized groundwater drawdown volume plus the
  extraction tubing volume (approximately 0.014 gallons per 10 feet of tubing).
  Stabilization is achieved when three consecutive readings, taken at 3 to 5 minute
  intervals, are within the following limits: within +/- 0.5 degrees Celsius; within +/- 0.1
  pH units; within +/- 10 µmhos/cm (or µS/cm) specific conductance or within 3% if
  specific conductance is greater than 300 µmhos/cm (or µS/cm); within +/- 10mV
  ORP/Eh.
- The amount of dissolved oxygen in the groundwater should be measured in each well after stabilization.
- A turbidity reading will be taken before the collection of the groundwater sample and the value will be recorded on the sampling log. Turbidity levels of less than 5 NTU are desirable but not mandatory.
- All measuring equipment will be decontaminated between uses (See Decontamination Protocols). The groundwater measuring equipment will be calibrated daily prior to use and in the field if field personnel suspect a problem with the calibration.
- Groundwater collected during purging and sampling of groundwater monitoring wells
  will be discharged to the subsurface at the point of withdrawal in accordance with
  Massachusetts General Law Chapter 21E and 310 CMR 40.0056 of the Massachusetts
  Contingency Plan. If purge water is grossly contaminated (i.e. contains free phase
  product) this water will be drummed and disposed of according to applicable municipal,
  state, and federal regulations (See Disposal Procedures).

#### 3.0 Groundwater Sampling Protocol Using the Peristaltic Pump

- Once stabilization of the groundwater parameters occurs, the sampling of the groundwater from the well begins. Groundwater sampling may be performed with bailers according to ECS SOP 8.10 or using the peristaltic pump and dedicated polyethylene tubing. The following SOP describes groundwater sampling using peristaltic pump, the dedicated section of silicon tubing, and the dedicated section of polyethylene tubing in the well.
- Immediately prior to sampling, the polyethylene tube leading to the flow-through chamber
  of the multiprobe water quality monitoring system is disconnected so that the groundwater
  flows directly from the ¼-inch silicone tubing into the sample vials.
- The location of the sampling point (or position of the end of the dedicated in-well tubing) will be the same location as it was during the purging process.
- If drawdown increases such that the recharge rate of the well is less than the slowest
  possible extraction rate, the well should be sampled as soon as the water level has recovered
  sufficiently to collect the appropriate volume needed for all required samples even though
  the parameters have not stabilized. The intake should not be lowered during the recovery
  period.
- Water samples for the analysis of volatile organic compounds (VOCs) and volatile petroleum hydrocarbons (VPH) will be collected first from the tubing in the water column in the well.
- Groundwater samples collected for the analysis of VOCs will be collected in duplicate 40-milliliter glass vials with zero headspace. Vials will be pre-preserved with hydrochloric acid to a pH of <2. The vial will be uncapped carefully in order to avoid contact with the Teflon septum. The vial will be filled slowly taking care not to agitate the sample which may mean slowing down the rate of the peristaltic pump. Each vial will be filled until there is a meniscus over the lip of the vial. If no meniscus forms, a sample of water will be collected in the cap and poured slowly into the vial to create a meniscus. The Teflon-faced septum will be placed on the convex meniscus and the cap screwed down. The vial will be inverted and tapped to check for the presence of air bubbles. If air bubbles are present, the sample will be discarded and another vial will be selected and filled.</p>
- Groundwater samples for analysis for PCBs, pesticides, total petroleum hydrocarbons, extractable petroleum hydrocarbons (EPH), semivolatiles organic compounds, metals, other inorganic compounds, and general chemical parameters will be collected last but immediately after collecting groundwater samples for analysis of VOCs.
- Groundwater samples for the analysis for dissolved (soluble) metals will be collected by connecting a dedicated 0.45 micron filter in-line to the ¼-inch silicone tubing. Care will be taken to adjust the pumping rate, in order to avoid any potential failure of the cartridge filter. The sample will be collected directly in a 1-liter HDPE bottle pre-preserved with nitric acid to achieve a pH <2.</p>

- The sample containers for groundwater samples collected for all analyses other than VOCs will be filled to 90% capacity. Care will be taken so that no portion of the sample comes in contact with the sampler's gloves. ECS Standard Operating Procedure (SOP) # 4.00 should be referenced for selection of proper sample containers and preservation methods for each analytical method.
- Duplicate samples, field blanks, and equipment rinsate blanks will be collected according to specified QA/QC frequency
- A trip blank consisting of deionized hydrocarbon-free laboratory water in a 40-milliliter Teflon-septum vial, prepared prior to sampling, will be present with the volatile samples at all times during sampling and transportation to the analytical laboratory, and will be subjected to the same analyses as the samples.
- All sample containers will be capped immediately after filling. The exterior of the
  container will be rinsed with deionized water and dried with paper towels. All sample
  containers will be labeled immediately upon collection with the following information: site;
  project number; well number; date; time of collection; testing parameters; initials of
  sampling personnel.
- All groundwater samples will be cooled to 4°C by placing them immediately in a chilled, thermally insulated container with ice and submitted as soon as possible to a Massachusettscertified analytical laboratory under Chain of Custody protocol. Information regarding sample holding times is found in Table 1. Information regarding Chain of Custody protocol is found in the Sample Custody Procedure.
- All equipment used to collect samples for analysis will be either decontaminated before each use or dedicated to a particular sample location after initial decontamination.
- Based on the results of previous sampling and analysis, sampling will progress from the least contaminated well to the most contaminated well.

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### WATER-LEVEL MEASUREMENT PROCEDURES

Depth to water-level measurements are taken to determine the elevation of the potentiometric surface. Water level measurements will be performed in each monitoring well prior to sampling. Because of fluctuating groundwater levels, all wells will be measured prior to sampling and within the same day, if possible. If the presence of NAPL is suspected, measurements will be made with an oil/water interface probe, otherwise, an electronic water level indicator will be used. These instruments are accurate to 0.01 feet. The following procedures are based on Massachusetts DEP guidelines (DEP, 1991) and ASTM Designations D 5092 - 90 and D 4750 - 87.

- The measuring instrument will be decontaminated prior to use and between wells according
  to the standard decontamination procedures.
- Measurements will progress from the least contaminated wells to the most contaminated wells.
- The well casing will be opened and the headspace will be monitored for total organic vapors
  using a PID or FID. If a reading of 5 ppm or greater is detected, the well will be allowed to
  vent for 5 to 10 minutes. If after this time the reading is 5 ppm or greater, a determination
  regarding the level of personal protective equipment needed will be made before sampling
  continues. If specified, PID or FID readings for well casing headspace will be recorded for
  each well.
- An interface probe will be lowered to the air-water interface and the depth to water will be
  recorded. The interface probe will be lowered to the bottom of the well to measure the
  depth of the well and in wells where chlorinated hydrocarbons were detected to determine if
  dense non-aqueous phase liquid (DNAPL) is present. If the presence of a free phase
  product (LNAPL) is indicated, the probe will be lowered to the product-water interface and
  the thickness of the product will be recorded but the depth of the well will not be measured.
- One water-level measurement will be made from a reference point on the PVC well riser
  pipe and another from the top of the protective well casing at the surface elevation. The
  reference point on the PVC will be a V-notch cut into the top edge of the riser pipe at the
  highest point. This will be the surveyed point on the riser. The reference point on the well
  riser is preferred for determining depth to water-level due to its stability. The protective
  well casing is more susceptible to movement through settling, frost heaving, or
  displacement by impact.

- The volume of standing water in the well (static volume) will be calculated and used during well purging prior to sampling.
- The total depth of the well, depth to product, depth to water, standing water height, and static volume will be recorded on the groundwater sampling log (attached).

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### DECONTAMINATION

Decontamination will be performed in order to: minimize the spread of contaminants on the Site and from one sampling location to another; reduce the potential exposure of field personnel to contaminants; and to ensure good data quality and reliability. Decontamination of all field analytical testing and sampling equipment will be performed according to the following procedures. These procedures are based on ASTM Designation D 5088-90, USEPA CERCLA QAPP Review Guidance, 1987, and Massachusetts DEP Standard Reference for Monitoring Wells, 1991.

Equipment cleaning procedures include pre-field, field, and post-field decontamination. Non-disposable equipment will be decontaminated after completing each sampling event. In cases of gross contamination (free phase product), rinse water will be contained for proper disposal according to municipal, state, and federal regulations. Decontamination procedures will be monitored through sampling and analysis when quality assurance/quality control checks are necessary.

Equipment will be dedicated to each sampling point and decontamination will be performed at the off-site facility as much as possible.

Decontaminated equipment will be rested on polyethylene sheeting at each sampling point.

Samplers will use new disposable gloves at each sampling point.

Potable water from the public water supply will be used for control rinse water.

A certified laboratory supply of deionized water will be used for decontamination of field testing and sampling equipment and for the collection of rinsate blanks. Deionized water will be stored in Nalgene, glass, or Teflon containers. The storage area containing the deionized water will be separated from the storage area for solvents.

Equipment rinsate blanks will be collected when a quality control check of the decontamination procedure is necessary. This check will not be performed if dedicated equipment is used. One blank will be collected at least once during a sampling event for each different piece of sampling equipment used. Rinsate blanks will be prepared by pouring deionized water over the decontaminated piece of equipment and collecting it in the sample container. The equipment rinsate blank will be analyzed for the same analytes as the samples that have been collected with that piece of equipment.

### 1.0 MATERIALS

- · health and safety equipment;
- laboratory-supplied deionized water;
- phosphate-free detergent (Alconox, Liquinox);
- potable water (municipal water source);
- · methanol;
- Hexane:
- Acetone;
- · nitric acid rinse solution;
- · wash basins;
- inert brushes;
- polyethylene sheeting;
- large heavy duty garbage bags;
- spray bottles;
- zip-lock bags;
- paper towels/Handiwipes;
- disposable gloves.

#### 2.0 DECONTAMINATION PROCEDURES

- Stainless steel bailers will be disassembled, soaked in hot potable water and scrubbed with a
  brush in "Alconox" detergent and potable water, and rinsed with clean potable water at the
  company's facility. Bailers will be allowed to air dry in a vertical position in a contaminantfree environment.
- Prior to the sampling event, bailers used for the collection of samples which will undergo analysis for total petroleum hydrocarbons and volatile organic compounds will be rinsed with hot potable water followed by a 10% methanol solution of pesticide grade methanol and deionized water, followed by a final rinse with deionized water. The volume of deionized water will be at least five times the volume of the methanol. Bailers used for the collection of samples which will undergo analysis for semi-volatile organic compounds, PCBs, and pesticides will be rinsed with a technical grade acetone followed by a pesticide grade hexane, and a final deionized water rinse as above. Bailers used for the collection of groundwater samples which will undergo analysis for metals will be rinsed with 10 per cent nitric acid solution prepared from reagent grade nitric acid and deionized water followed by a potable water rinse, and a final deionized water rinse.
- Bailers will be wrapped in an inert material (i.e. plastic bags) and stored in a clean environment during transport to the Site.

- Following sample collection, the stainless-steel bailers will be rinsed with clean potable
  water and placed in a plastic bag for transport to the company's facility where
  decontamination will take place.
- Soil and sediment sampling equipment (stainless steel sampling scoop, tool, and bowl, split-spoon and macro-core sampler, knife) will be decontaminated in the field after each use.
- Soil and sediment sampling equipment will be decontaminated as follows: scrubbed with
  inert brushes in a bucket containing phosphate-free detergent and potable water; rinsed with
  potable water; rinsed with pesticide grade methanol; and finally rinsed with deionized
  water. The final potable water and deionized water rinse volumes will equal 5 times the
  volume of the methanol rinse. The equipment will be allowed to air dry and will be stored
  in a clean environment until reused.
- Non-dedicated field equipment used for the collection of samples to be analyzed for metals
  and filtering apparatus will be cleaned prior to each use by using a phosphate-free detergent
  solution, a potable water rinse, followed by a 10 percent nitric acid rinse solution prepared
  from reagent grade nitric acid and deionized water, a potable water rinse, and a final rinse
  with deionized water. Used filters will be properly disposed of.
- The YSI Water Quality Monitoring System™, Geotech Multi Parameter™ meter, interface
  probe, down-hole slug test equipment, QED Water Wizard well development equipment,
  and other measuring instruments will be decontaminated between uses by rinsing with
  Alconox or Liquinox, followed by potable water and deionized water rinses. A methanol
  rinse will be utilized prior to the deionized water rinse in the event of gross contamination
  such as contact with free-phase product.
- The drill rig and earthprobe and all drilling equipment and associated tools, including but not limited to augers, drill casing, drill rods, sampling equipment, and wrenches, will be steam cleaned prior to beginning the drilling on the Site. This cleaning will consist of using a high pressure detergent steam cleaning equipment, followed by a nanograde methanol swabbing if gross contamination was present. This will be followed by a controlled water rinse. Any down-hole equipment (auger flights, rods, sampling equipment, etc.) coming in contact with gross contamination (i.e. free phase product) will be steam-cleaned between uses. Otherwise equipment will be scrubbed manually with potable water and Alconox as needed to remove soil between uses.
- Sampling equipment and probes will be decontaminated in an area covered by polyethylene sheeting adjacent to the sampling location.
- In cases of gross contamination (i.e. free phase product) rinse water will be collected for proper disposal according to municipal, state or federal regulations. Contaminated solids (disposable gloves, clothing, polyethylene tubing and sheeting, etc.) will be collected and characterized for proper disposal.
- Decontamination procedures will be fully documented in the field notebook. The following information should be recorded: Site location, date, time and weather; sample location

where equipment used; location where decontamination was performed; field personnel performing the decontamination; decontamination procedures; disposal of rinse water if necessary; samples collected for QA/QC and analytical results.

 Health and safety procedures associated with decontamination are found in the Health and Safety Plan.

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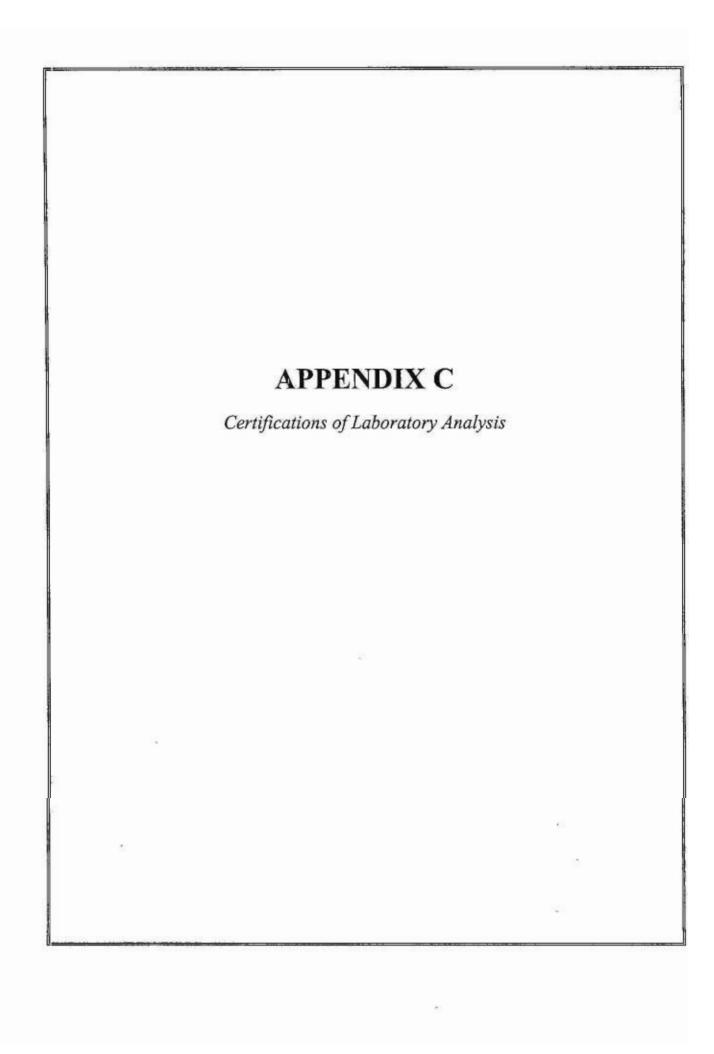
### SAMPLE CUSTODY PROCEDURES

- Sample custody procedures will be followed in order to create an accurate written record.
  This record can be used to trace the possession and handling of all samples from collection,
  through all transfers of custody until the samples are delivered to the analytical laboratory.
  Custody for samples will be maintained by field personnel collecting the samples. The
  following procedures are based on ASTM Designation D 4840-88, standard methods found
  in DEP (1991), and USPEA (1987) guidance documents.
- A self-adhesive waterproof sample label will be affixed to each sample container before sample collection. A waterproof pen will be used to record the following information on the label:

Project Number
Sample ID Number
Sample Location
Sample Matrix
Date and Time of Sample Collection
Designation as Grab or Composite Sample
Parameters to be Tested
Preservative
Initials of Sampler

- All sample containers will be supplied by a state-certified laboratory. Commercially
  purchased sample containers will be pre-cleaned and quality controlled according to EPA
  recommended washing procedures and specifications (Level I and/or Level A according to
  the vendor's specifications). Custody of the sample containers will be maintained by the
  Project Manager and will be relinquished to the field personnel collecting the samples after
  verification that the proper containers have been assigned for the proper sampling task.
- Chemical preservatives will be added to the sample containers by the state-certified laboratory providing the containers. Tables 1 and 2 indicate the type of preservation which will be used.
- Chain-of-custody records will be filled out by the sampler using information from the sample labels. The chain-of-custody will include the dates and times of collection and receipt. The chain-of-custody will document any tampering that may have occurred; if there are no such comments then no tampering was observed. An example of the chain of custody (provided by Spectrum Analytical, Inc. of Agawam, Massachusetts) is included.

- One chain-of-custody record will be used for each packaged lot of samples. More than one chain-of-custody may be used for one packaged lot.
- Samples will be stored in a thermally insulated container with ice. EPA protocols do not allow the use of ice packs or ice substitutes because they are unable to reach or maintain a cold enough temperature. The samples will be delivered to a state-certified laboratory by a member of the sampling team within 24 hours of sample collection. The field chain-of-custody records completed at the time of sample collection will be placed inside the cooler for transport to the laboratory. These forms will be sealed in a zip-lock type plastic bag to protect them against moisture. Each cooler will contain sufficient ice to insure that a 4°C temperature is maintained, and will be packed in a manner to prevent damage to the sample containers.
- The chain-of-custody form will be signed by the relinquishing party and the receiving party.
   The reason for transfer will be indicated each time the sample custody changes. Internal laboratory records will document sample custody until its final disposition.





## Featuring

### HANIBAL TECHNOLOGY

Massachusetts Certification # M-MA138 Rhode Island # 98 Maine # MA138 Florida # E87600 / 87562 New Hampshire # 2538 Connecticut # PH-0777 New York # 11393

ECS, Inc. 588 Silver Street Agawam, MA 01001

Attn: Chris Parent

Client Project Number: 13997



Thursday, April 26, 2001

Report Status:

Final Report

☐ Re-issued Report

Revised Report

Location: Wayside Ave-W. Springfield

Cheme 1 Toject i tamo				AND AND THE PERSON SECTION AND ADDRESS OF THE PERSON ADDRESS OF THE PERSON AND ADDRESS OF THE PERSON	
Laboratory ID		Client Sample ID	1.3810.60	Analyses Requested	
AC42575		S-1		Ultrasonic Extraction	
110 120 10				EPH Aliphatics/Aromatics	
				EPH Target PAH Analytes	
				VOC Extraction (solid)	
				VPH Aliphatics/Aromatics	
			53	VPH Target Analytes	
			2	% Solids	
AC42576	23	S-3		Ultrasonic Extraction	
		39900000		EPH Aliphatics/Aromatics	
				EPH Target PAH Analytes	
			97	VOC Extraction (solid)	
				VPH Aliphatics/Aromatics	
				VPH Target Analytes	
				% Solids	
AC42577		S-13		Ultrasonic Extraction	
				EPH Aliphatics/Aromatics	
				EPH Target PAH Analytes	
				VOC Extraction (solid)	
				VPH Aliphatics/Aromatics	
		10		VPH Target Analytes	
(P)				% Solids	
AC42578		S-17		Ultrasonic Extraction	
				EPH Aliphatics/Aromatics	
				EPH Target PAH Analytes	
				VOC Extraction (solid)	
		27		VPH Aliphatics/Aromatics	
**			3.7	VPH Target Analytes	
	may wise	5390 14			_



# Featuring HANIBAL TECHNOLOGY

Client Project Number: 13997

Location: Wayside Ave-W. Springfield

Laboratory ID	Client Sample ID	Analyses Requested
AC42578	S-17	% Solids
AC42579	S-20	Ultrasonic Extraction
		EPH Aliphatics/Aromatics
1		EPH Target PAH Analytes
		VOC Extraction (solid)
		VPH Aliphatics/Aromatics
E E 9	74	VPH Target Analytes
e .		% Solids
AC42580	S-23	Ultrasonic Extraction
The second secon		EPH Aliphatics/Aromatics
		EPH Target PAH Analytes
		VOC Extraction (solid)
		VPH Aliphatics/Aromatics
	**	VPH Target Analytes
7		% Solids
AC42581	S-24	Ultrasonic Extraction
	No. (Proportio	EPH Aliphatics/Aromatics
		EPH Target PAH Analytes
		VOC Extraction (solid)
•		VPH Aliphatics/Aromatics
F 16		VPH Target Analytes
		% Solids
AC42582	S-25	Ultrasonic Extraction
		EPH Aliphatics/Aromatics
£:		EPH Target PAH Analytes
		VOC Extraction (solid)
		VPH Aliphatics/Aromatics
* *		VPH Target Analytes
2		% Solids
AC42583	S-27	Ultrasonic Extraction
	7.5	EPH Aliphatics/Aromatics
		EPH Target PAH Analytes
		VOC Extraction (solid)
6		VPH Aliphatics/Aromatics
*		VPH Target Analytes
		% Solids



### Featuring HANIBAL TECHNOLOGY

Client Project Number: 13997

Location: Wayside Ave-W. Springfield

Laboratory ID

Client Sample ID

Analyses Requested

I attest that all information contained within this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method and meet the requirements of NELAC including any data obtained from a subcontract laboratory. Please note that all solid matrix sample results are calculated on a dry weight basis unless otherwise specified.

This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

Haniba

President/Laboratory Director

Laboratory Report

Location: Wayside Ave-W. Springfield

Client: ECS

Lab ID No: AC42575

Client Id: S-1

Client Project No: 13997

Submittal Date: 4/25/01 Collection Date: 4/24/01

Parameter	Results	Units	PQL	Start Date		Analyst	Method
VOC Preparation					K,		
VOC Extraction (solid)	Field ext			4/24/01	57		SW846 5035
Volatile Organic Compounds							
VPH Aliphatics/Aromatics							
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.810	4/25/01		RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.270	4/25/01	9	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.270	4/25/01		RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	0.810	4/25/01		RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.270	4/25/01		RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/25/01		RLJ	MA VPH 97-12
VPH Target Analytes							
Benzene Toluene	Below det lim	ug/Kg	54	4/25/01		RLJ	MA VPH 97-12
Toluene	Below det lim	ug/Kg	54	4/25/01		RLJ	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	54	4/25/01		RLJ	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	110	4/25/01		RLJ	MA VPH 97-12
o-Xylene	Below det lim	ug/Kg	54	4/25/01		RLJ	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	54	4/25/01		RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	54	4/25/01		RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	112	ug/Kg	0.	4/25/01		RLJ	MA VPH 97-12
A Section Section 1	110	ug/Kg	0.	4/25/01		RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID  2,5-Dibromotoluene (%SR) GCMS	NA.	ug/Kg	0.	4/25/01		RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01		RLJ	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/25/01	10	RLJ	MA VPH 97-12
TPH Preparation					50		
Ultrasonic Extraction	Completed	72		4/25/01		RTW	SW846 3550B
Petroleum Hydrocarbon Analysis					20		
EPH Aliphatics/Aromatics						10	
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01		LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01		LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01		LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	30	4/25/01		LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01		LR	MA EPH 98-1
EPH Target PAH Analytes					15		
Naphthalene	Below det lim	ug/Kg	140	4/25/01	134	LR	MA EPH 98-1

Client Id: S-1

Collection Date: 4/24/01

Parameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes	***************************************		(T) (1)		27777 <b>4</b> 333	-10-10-5
Methylnaphthalene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Phenanthrens	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Anthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Fluoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (k) fluoranthene Benzo (a) pyrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Dibenzo (a, a) anthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	72	ug/Kg	0.	-4/25/01	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	52	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Bromona ohthalene Fractionation (%SR)	72	ug/Kg	0.	-4/25/01	LR	MA EPH 98-1
2-Fluorobir-henyl Fractionation (%SR)	72	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Fluorobir henyl Fractionation (%SR) Target Analyte Dilution Factor	1	ug/Kg	0.	.4/25/01	LR	MA EPH 98-1
% Solids	93.8	%	100	4/25/01	RTW	SM2540 B Mod

Client Id: S-3

Collection Date: 4/24/01

Parameter "	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/24/01 -		SW846 5035
Volatile Organic Compounds						
VPH Aliphetics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	1.22	4/25/01	RLJ	MA VPH 97-1
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.405	4/25/01	RLJ	MA VPH 97-1
C9-C10 Arcmatic Hydrocarbons	Below det lim	mg/Kg	0.405	4/25/01	RLJ	MA VPH 97-1
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	1.22	4/25/01	RLJ	MA VPH 97-1
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.405	4/25/01	RLJ	MA VPH 97-1
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/25/01	RLJ	MA VPH 97-1
VPH Target Analytes		(8)				
Benzene	Below det lim	ug/Kg	81	4/25/01	RLJ	MA VPH 97-1
Toluene	Below det lim	ug/Kg	81	4/25/01	RLJ	MA VPH 97-1
Ethylbenzene	Below det lim	ug/Kg	81	4/25/01	RLJ	MA VPH 97-1
m,p-Xylenes	Below det lim	ug/Kg	160	4/25/01	RLJ	MA VPH 97-1
o-Xylene	Below det lim	ug/Kg	81	4/25/01	RLJ	MA VPH 97-1
Naphthalene	Below det lim	ug/Kg	81	4/25/01	RLJ	MA VPH 97-1
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	81	.4/25/01-	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) PID	92	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
2,5-Dibromotoluene (%SR) FID	91	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
2,5-Dibromotoluene (%SR) FID 2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-1
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
Target Analytes Dilution Factor	50	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
TPH Preparation				20		
Ultrasonic Extraction	Completed			4/25/01	RTW	SW846 3550
Petroleum Hydrocarbon Analysis  EPH Aliphatics/Aromatics  C9-C18 Aliphatic Hydrocarbons						22
EPH Aliphatics/Aromatics					5/	
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	· LR	MA EPH 98-
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98-
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01	LR	MA EPH 98-
EPH Target PAH Analytes	729670 E.Moree	0.00	No. Charles	7 0.00cm 10.00cm		
Naphthalene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-
2-Methylnaphthalene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-
Acenaphthylene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-
Acenaphthene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-
Fluorene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-
Phenanthrene	Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98-

Client Id: S-3

Collection Date: 4/24/01

Parameter	Results	Units	PQL	Start Date	150	Analyst	Method
EPH Targer PAH Analytes					4	BORDEL STR	
Anthracene	Below det lim	ug/Kg	170	4/25/01		LR	MA EPH 98-1
Fluoranthene	Below det lim	ug/Kg	170	4/25/01	5	LR	MA EPH 98-1
Рутепе	Below det lim	ug/Kg	170	4/25/01	1.	LR	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	170	4/25/01		LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	170	4/25/01	34	LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	170	4/25/01	19	LR	MA EPH 98-1
Benżo (k) fluoranthene	Below det lim	ug/Kg	170	4/25/01	23	LR	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	170	4/25/01	5	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	170	4/25/01		LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	170	4/25/01	1	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	170	4/25/01		LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	67	ug/Kg	0.	4/25/01	(b) 51	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR) Ortho-Terphenyl Aromatic (%SR)	59	ug/Kg	0.	4/25/01	20	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	88	ug/Kg	0.	4/25/01		LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR) Target Analyte Dilution Factor	81	ug/Kg	0.	4/25/01		LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	. 0.	4/25/01	9	LR	MA EPH 98-1
% Solids	77.5	%		4/25/01		RTW	SM2540 B Mod

Client Id: S-13

Collection Date: 4/24/01

arameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation					29 Si	
OC Extraction (solid)	Field ext			4/24/01	10	SW846 5035
Volatile Organic Compounds				10	. 44	
PH Aliphatics/Aromatics	2					A W COMMON WAY
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.810	4/25/01	RLJ	MA VPH 97-1
29-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.270	4/25/01	RLJ	MA VPH 97-1
C9-C10 Arematic Hydrocarbons	Dolow det IIII	mg/Kg	0.270	4/25/01	RLJ	MA VPH 97-1
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	0.810	4/25/01	RLJ	MA VPH 97-1
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.270	4/25/01	RLJ	MA VPH 97-1
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/25/01	RLJ	MA VPH 97-1
VPH Target Analytes				¥0	*	
Benzene Toluene	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-1
	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-1
Ethylbenzene	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-1
m,p-Xylenes	Below det lim	ug/Kg	110	4/25/01	RLJ	MA VPH 97-1
o-Xylene	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-1
Naphthalene	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	54	4/25/01	RLJ	MA VPH 97-
2,5-Dibromotoluene (%SR) PID	97	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
2,5-Dibromotoluene (%SR) FID 2,5-Dibromotoluene (%SR) GCMS	95	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
Target Analytes Dilution Factor	50	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-1
TPH Preparation					X1	
Ultrasonic Extraction	Completed			4/25/01	RTW	SW846 3550
Petroleum Hydrocarbon Analysis					34	
EPH Aliphatics/Aromatics		-			y	
C9-C18 Aliphatic Hydrocarbons	Below det lim		30	4/25/01	LR	MA EPH 98-
C19-C36 Aliphatic Hydrocarbons	Below det lim		30	4/25/01	, LR	MA EPH 98-
C11-C22 Aromatic Hydrocarbons	Below det lim		30	4/25/01	LR	MA EPH 98-
Unadjusted C11-C22 Aromatics	Below det lim		30	4/25/01	LR	MA EPH 98-
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01	LR	MA EPH 98-
EPH Target PAH Analytes	1000	720			3	200000000000000000000000000000000000000
Naphthalene	Below det lim		140	4/25/01	LR	MA EPH 98-
2-Methylnaphthalene	Below det lim		140	4/25/01	LR	MA EPH 98-
Acenaphthylene	Below det lim		140	4/25/01	, LR	MA EPH 98-
Acenaphthene	Below det lim		140	4/25/01	LR	MA EPH 98-
Fluorene	Below det lim		140	4/25/01	LR	MA EPH 98-
Phenanthrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-

Client Id: S-13

% Solids

Collection Date: 4/24/01 Matrix: Soil

4/25/01

RTW

SM2540 B Mod

arameter Results Units PQL Start Date Analyst Method EPH Target PAH Analytes nthracene Below det lim ug/Kg 140 4/25/01 LR MA EPH 98-1 luoranthene Below det lim ug/Kg 140 4/25/01 LR MA EPH 98-1 Pyrene Below det lim ug/Kg 140 4/25/01 LR MA EPH 98-1 Benzo (a) ar thracene Below det lim ug/Kg 140 4/25/01 LR MA EPH 98-1 Chrysene Below det lim ug/Kg 140 4/25/01 LR MA EPH 98-1 Benzo (b) fluoranthene Below det lim ug/Kg 4/25/01 LR 140 MA EPH 98-1 Benzo (k) fluoranthene Below det lim ug/Kg 140 4/25/01 LR MA EPH 98-1 Benzo (a) pyrene Below det lim ug/Kg 140 4/25/01 LR MA EPH 98-1 Indeno (1,2,3-cd) pyrene Below det lim ug/Kg 140 4/25/01 LR MA EPH 98-1 Dibenzo (a,lı) anthracene Below det lim ug/Kg 4/25/01 140 LR MA EPH 98-1 Benzo (g,h,i) perylene Below det lim ug/Kg 140 4/25/01 LR MA EPH 98-1 1-Chloro-octadecane Aliphatic (%SR) 66 ug/Kg 0. 4/25/01 LR MA EPH 98-1 Ortho-Terphenyl Aromatic (%SR) 54 ug/Kg 0. 4/25/01 LR MA EPH 98-1 2-Bromonaphthalene Fractionation (%SR) 73 ug/Kg 0. 4/25/01 LR MA EPH 98-1 2-Fluorobiphenyl Fractionation (%SR) 72 ug/Kg .0. 4/25/01 LR . MA EPH 98-1 Target Analyte Dilution Factor 1 ug/Kg 0. 4/25/01 LR MA EPH 98-1

%

94.9

Client Id: S-17

Collection Date: 4/24/01

arameter	Results	Units	PQL	Start Date	* 1		Analyst	Method
VOC Preparation							63	ĸ
OC Extraction (solid)	Field ext			4/24/01		ž.	11	SW846 5035
Volatile Organic Compounds				200				
PH Aliphatics/Aromatics	T 5 737 N	1		200				
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	1.27	4/25/01			RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.425	4/25/01			RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.425	4/25/01	2		RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	1.27	4/25/01			RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.425	4/25/01			RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/25/01			RLJ	MA VPH 97-12
VPH Target Analytes							+	
Benzene Toluene	Below det lim	ug/Kg	85	4/25/01			RLJ	MA VPH 97-17
	Below det lim	ug/Kg	85	4/25/01	+1		RLJ	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	85	4/25/01			RLJ	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	170	4/25/01			RLJ	MA VPH 97-1:
o-Xylene	Below det lim	ug/Kg	85	4/25/01	**		RLJ	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	85	4/25/01			RLJ	MA VPH 97-1:
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	85	4/25/01	+	351	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	91	ug/Kg	0.	4/25/01	9		RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	90	ug/Kg	0.	4/25/01	8.9		RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID 2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	63		- RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	4		· RLJ	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/25/01			RLJ	MA VPH 97-1
TPH Preparation							× , 2	
Ultrasonic Extraction	Completed			4/25/01			RTW	SW846 3550B
Petroleum Hydrocarbon Analysis								27
EPH Aliphatics/Aromatics C9-C18 Aliphatic Hydrocarbons							360 77	
	Below det lim	mg/Kg	- 40	4/25/01			LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	40	4/25/01			·LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	40	4/25/01			. LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	40	4/25/01			LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01			. LR	MA EPH 98-1
EPH Target PAH Analytes		-					5	2722752222222
Naphthalene	Below det lim	ug/Kg	180	4/25/01			LR	MA EPH 98-1
2-Methylnaphthalene Acenaphthylene	Below det lim	ug/Kg	180	4/25/01			·LR	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	180	4/25/01	20		LR	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	180	4/25/01	20		LR	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	180	4/25/01			LR	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	180	4/25/01			LR	MA EPH 98-1

Client Id: S-17

Collection Date: 4/24/01

Parameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes					5400 C.	
Anthracene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
luoranthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (a) ar thracene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	54	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	40	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	78	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	72 .	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
% Solids	75.8	%		4/25/01	RTW	SM2540 B Mod
20 240						

Client Id: S-20

Collection Date: 4/24/01

Parameter Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext		100	4/24/01	22	SW846 5035
Volatile Organic Compounds		+1				45
PH Aliphatics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.960	4/25/01	RLJ ·	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.320	4/25/01	RLJ · ·	MA VPH 97-12
C9-C10 Arcmatic Hydrocarbons	Below det lim	mg/Kg	0.320	4/25/01	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	0.960	4/25/01	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.320	4/25/01	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/25/01	RLJ ···	MA VPH 97-12
VPH Target Analytes	$_{\mathcal{Z}}$					
Benzene	Below det lim	ug/Kg	64	4/25/01	RLJ	MA VPH 97-12
Toluene	Below det lim	ug/Kg	64	4/25/01	RLJ	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	64	4/25/01	RLJ	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	130	4/25/01	RLJ	MA VPH 97-12
o-Xylene	Below det lim	ug/Kg	64	4/25/01	RLJ	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	64	4/25/01	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	64	4/25/01	RLJ .	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	91	ug/Kg	0.	4/25/01	RLJ -	MA VPH 97-12
2,5-Dibron otoluene (%SR) FID	89	ug/Kg	0.	4/25/01	RLJ .	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID 2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/25/01	RTW-	SW846 3550B
Petroleum Hydrocarbon Analysis						E 5.591
EPH Aliphatics/Aromatics C9-C18 Aliphatic Hydrocarbons	T. 1 . 1 . 1	res	**	410.7104	5	
	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01	LR ·	MA EPH 98-1
EPH Target PAH Analytes Naphthalene	Below det lim	/W.	100	4/25/01	r n	MA EDIT OF 1
		ug/Kg	180	4/25/01	LR	MA EPH 98-1
2-Methylm:phthalene Acenaphthylene	Below det lim Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
		ug/Kg	180	4/25/01	LR	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1

Lab ID No: AC42579 Client Id: S-20 Collection Date: 4/24/01

Parameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes						
Anthracene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
luoranthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1.
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	180	4/25/01	LR	MA EPH 98-1
I-Chloro-octadecane Aliphatic (%SR)	97	ug/Kg	- 0.	4/25/01	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	55	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	97	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	89	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
% Solids	81.1	%		4/25/01	RTW	SM2540 B Mod

Client Id: S-23

Collection Date: 4/24/01

Parameter	*	٠,	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation	6							
VOC Extraction (solid)	10	13.	Field ext			4/24/01		. SW846 5035
Volatile Organic Compounds	**	100	18					
VPH Aliphatics/Aromatics C5-C8 Aliphatic Hydrocarbons	5.0		2.7	mg/Kg	0.765	4/25/01	RLJ	MA VPH 97-1
C9-C12 Aliphatic Hydrocarbons	10.00	10	3.8	mg/Kg	0.765	4/25/01	RLJ	MA VPH 97-1
C9-C10 Aromatic Hydrocarbons			3.9	mg/Kg	0.255	4/25/01	RLJ	MA VPH 97-1
Unadjusted C5-C8 Aliphatics	91	-	2.7	mg/Kg	0.765	4/25/01	RLJ	MA VPH 97-
-37	100		7.7	mg/Kg	0.765	4/25/01	RLJ	MA VPH 97-
Unadjusted C9-C12 Aliphatics Carbon Chain Dilution Factor	7.9				0.233	4/25/01	RLJ	MA VPH 97-
CHI COLL CHICAL PROPERTY AND A SECOND	4	S	50	mg/Kg	0.	4/25/01	KU	MA VPH 91-
VPH Target Analytes Benzene		53 3	Below det lim	ug/Kg	51	4/25/01	RLJ	MA VPH 97-
	: +		Below det lim		51	4/25/01	RLJ	MA VPH 97-
Toluene	- +	16	Below det lim	ug/Kg	51	4/25/01	RLJ	MA VPH 97-
Ethylbenzene	54		Below det lim	ug/Kg	100	4/25/01	RLJ	MA VPH 97-
m,p-Xylenes	3	110		ug/Kg				
o-Xylene	H.	1.0	Below det lim	ug/Kg	51	4/25/01	RLJ	MA VPH 97-
Naphthaler.e	Ø,	174	Below det lim	ug/Kg	51	4/25/01	RLJ	MA VPH 97-
Methyl-tert-butyl ether (MTBE)			Below det lim	ug/Kg	51	4/25/01	RLJ	MA VPH 97-
2,5-Dibroniotoluene (%SR) PID			100	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
2,5-Dibromotoluene (%SR) FID 2,5-Dibromotoluene (%SR) GCM	-		96	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
2,5 Distributed (700x) Cox.			NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
4-Bromofluorobenzene (%SR) GO	CMS		NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
Target Analytes Dilution Factor			50	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
TPH Preparation			C11			1/25/01	Danie	0111046266
Ultrasonic Extraction			Completed			4/25/01	RTW	SW846 3550
Petroleum Hydrocarbon Analyst EPH Aliphatics/Aromatics	sis							
EPH Aliphatics/Aromatics C9-C18 Aliphatic Hydrocarbons			Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98
C19-C36 Aliphatic Hydrocarbons	677		Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98
C11-C22 Aromatic Hydrocarbons			Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98
Unadjusted C11-C22 Aromatics			Below det lim	mg/Kg	40	4/25/01	LR	MA EPH 98
Carbon Chain Dilution Factor			1	mg/Kg	0.	4/25/01	LR	MA EPH 98
EPH Target PAH Analytes								
Naphthalene			Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98
2-Methylnaphthalene Acenaphthylene			Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98
Acenaphthylene			Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98
Acenaphthene			Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98
Fluorene			Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98
Phenanthrene			Below det lim	ug/Kg	190	4/25/01	LR	MA EPH 98

Client Id: S-23

Collection Date: 4/24/01

arameter	Results	Units	PQL	Start Date	+.	Analyst	Method
EPH Target PAH Analytes					4		
nthracene	Below det lim	ug/Kg	190	4/25/01		LR	MA EPH 98-1
luoranthene	250	ug/Kg	190	4/25/01	*	LR	MA EPH 98-1
Pyrene	220	ug/Kg	190	4/25/01		LR	MA EPH 98-1
enzo (a) anthracene	Below det lim	ug/Kg	190	4/25/01	(4.4)	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	190	4/25/01		LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	190	4/25/01	Sec.	LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	190	4/25/01		LR	MA EPH 98-1
Вепло (а) рутепе	Below det lim	ug/Kg	190	4/25/01	,	LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	190	4/25/01		LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene Dibenzo (a,lı) anthracene	Below det lim	ug/Kg	190	4/25/01	29	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	190	4/25/01		LR	MA EPH 98-1
-Chloro-octadecane Aliphatic (%SR)	. 106	ug/Kg	0.	4/25/01		LR	MA EPH 98-1
-Chloro-octadecane Aliphatic (%SR) Ortho-Terphenyl Aromatic (%SR)	66	ug/Kg	0.	4/25/01	56	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	102	ug/Kg	0.	4/25/01		LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	89	ug/Kg	0.	4/25/01		LR	MA EPH 98-1
Target Analyte Dilution Factor	. 1	ug/Kg	0.	4/25/01		LR	MA EPH 98-1
% Solids	88.6	%		4/25/01		RTW	SM2540 B Mod

Client Id: S-24

Collection Date: 4/24/01

arameter	Results	Units	PQL	Start Date		4	Analyst	Method
OC Preparation								
OC Extraction (solid)	Field ext			4/24/01				SW846 5035
Volatile Organic Compounds			<del>1</del> 77					
PH Aliphatics/Aromatics								
5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.690	4/25/01	12	35	RLJ	MA VPH 97-1
C9-C12 Alir hatic Hydrocarbons	Below det lim	mg/Kg	0.230	4/25/01	-		RLJ	MA VPH 97-1
9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.230	4/25/01	60		RLJ	MA VPH 97-1
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	0.690	4/25/01			RLJ	MA VPH 97-1
Jnadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.230	4/25/01			RLJ	MA VPH 97-1
Carbon Cha n Dilution Factor	50	mg/Kg	0.	4/25/01	33		RLJ	MA VPH 97-1
VPH Target Analytes		5						
Benzene	Below det lim	ug/Kg	46	4/25/01			RLJ	MA VPH 97-1
Toluene	Below det lim	ug/Kg	46	4/25/01			RLJ	MA VPH 97-1
Ethylbenzene	Below det lim	ug/Kg	46	4/25/01			RLJ	MA VPH 97-1
m,p-Xylenes	Below det lim	ug/Kg	92	4/25/01			RLJ	MA VPH 97-1
o-Xylene	Below det lim	ug/Kg	46	4/25/01			RLJ	MA VPH 97-1
Naphthalene	Below det lim	ug/Kg	46	4/25/01			RLJ	MA VPH 97-1
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	46	4/25/01			RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) PID	121	ug/Kg	0.	4/25/01			RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) FID	121	ug/Kg	0.	4/25/01			RLJ	MA VPH 97-1
2,5-Dibrorrotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01			RLJ	MA VPH 97-1
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01			RLJ	MA VPH 97-1
Target Analytes Dilution Factor	50	ug/Kg	0.	4/25/01		9	RLJ	MA VPH 97-1
TPH Preparation								
Ultrasonic Extraction	Completed			4/25/01	22	198	RTW	SW846 35501
Petroleum Hydrocarbon Analysis								
EPH Aliphatics/Aromatics C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/25/01			LR	MA EPH 98-
C19-C36 Aliphatic Hydrocarbons	Below det lim		30	4/25/01			LR	MA EPH 98-
C11-C22 Aromatic Hydrocarbons	Below det lim		30	4/25/01			LR	MA EPH 98-
Unadjusted C11-C22 Aromatics	Below det lim		30	4/25/01			LR	MA EPH 98-
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/25/01			LR	MA EPH 98-
EPH Target PAH Analytes	35.0							
Naphthalene	Below det lim	ug/Kg	140	4/25/01			LR	MA EPH 98-
	Below det lim		140	4/25/01	25:		LR	MA EPH 98-
2-Methylnaphthalene Acenaphthylene	Below det lim		140	4/25/01		(0.0)	LR	MA EPH 98-
Acenaphthene	Below det lim		140	4/25/01			LR	MA EPH 98-
Fluorene	Below det lim		140	4/25/01			LR	MA EPH 98-
Phenanthrene	Below det lim		140	4/25/01			LR	MA EPH 98-

Client Id: S-24

Collection Date: 4/24/01

arameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes						
nthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
luoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
enzo (a) anthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
ndeno (1,2,3-cd) pyrene	. Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	140	4/25/01	LR	MA EPH 98-1
-Chloro-octadecane Aliphatic (%SR)	71	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	62	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	98	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	83	ug/Kg	0.	4/25/01	LR	MA EPH 98-1
Target Analyte Dilution Factor	1 .	ug/Kg	0.	4/25/01	- LR	MA EPH 98-1
% Solids	93.4	%		4/25/01	RTW	SM2540 B Mod

Client Id: S-25

Collection Date: 4/24/01

The second secon						
arameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
OC Extraction (solid)	Field ext			4/24/01	6	SW846 5035
Volatile Organic Compounds  PH Aliphatics/Aromatics	*	17		21		
C5-C8 Aliphatic Hydrocarbons	13	mg/Kg	4.14	4/25/01	RLJ -	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	70	mg/Kg	1.38	4/25/01	RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	103	mg/Kg	1.38	4/25/01	RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	25	mg/Kg	4.14	4/25/01	RLJ -	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	173	mg/Kg	1.38	4/25/01	RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	250	mg/Kg	0.	4/25/01	RLJ	MA VPH 97-12
VPH Target Analytes	200	mgrig	0.	1123101	100	1111 1111 11
Benzene .	Below det lim	ug/Kg	280	4/25/01	RLJ	MA VPH 97-12
Toluene	Below det lim	ug/Kg	280	4/25/01	RLJ	MA VPH 97-12
Ethylbenzene	2,200	ug/Kg	280	4/25/01	RLJ	MA VPH 97-12
m,p-Xylenes	10,200	ug/Kg	550	4/25/01	RLJ	MA VPH 97-12
o-Xylene	1,400	ug/Kg	280	4/25/01	RLJ	MA VPH 97-12
Naphthalene	3,600	ug/Kg	280	4/25/01	RLJ	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	280	4/25/01	RLJ	MA VPH 97-1:
2,5-Dibromotoluene (%SR) PID	98	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-1:
	117	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID 2,5-Dibromotoluene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-1
4-Bromofluorobenzene (%SR) GCMS	NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-1
Target Analytes Dilution Factor	250	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/25/01	RTW	SW846 3550B
Petroleum Hydrocarbon Analysis					1	
EPH Aliphatics/Aromatics	***			2000		
C9-C18 Aliphatic Hydrocarbons	200	mg/Kg	40	4/25/01	LR	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	260	mg/Kg	40	4/25/01	LR	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	272	mg/Kg	40	4/25/01	LR	MA EPH 98-1
Unadjusted C11-C22 Aromatics	291	mg/Kg	40	4/25/01	LR	MA EPH 98-1
Carbon Chain Dilution Factor  EPH Target PAH Analytes	1	mg/Kg	0.	4/25/01	LR	MA EPH 98-1
EPH Target PAH Analytes Naphthalene	8,700	ug/Kg	210	4/25/01	LR	MA EPH 98-1
	9,600	ug/Kg	210	4/25/01	LR	MA EPH 98-1
2-Methylmiphthalene Acenaphthylene	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
	Below det lim	ug/Kg	210	4/25/01	LR	MA EPH 98-1
Fluorene Phenanthrone		100000000000000000000000000000000000000				
Phenanthrene	250	ug/Kg	210	4/25/01	LR	MA EPH

Client Id: S-25

Collection Date: 4/24/01

Parameter	Results	Units	PQL	Start Date	¥0 0	Analyst	Method
EPH Target PAH Analytes							
Anthracene	Below det lim	ug/Kg	210	4/25/01		LR	MA EPH 98-1
luoranthene	330	ug/Kg	210	4/25/01		LR	MA EPH 98-1
Pyrene	330	ug/Kg	210	4/25/01		LR	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	210	4/25/01	9	LR	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	210	4/25/01		LR	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	210	4/25/01		LR	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	210	4/25/01		LR	MA EPH 98-1
Вепло (а) рутепе	Below det 1im	ug/Kg	210	4/25/01		LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	210	4/25/01		LR	MA EPH 98-1
Dibenzo (a, 1) anthracene	Below det lim	ug/Kg	210	4/25/01		LR	MA EPH 98-1
Benzo (g,h,:) perylene	Below det lim	ug/Kg	210	4/25/01		LR	MA EPH 98-1
II-Chloro-octadecane Aliphatic (%SR)	68	ug/Kg	0.	4/25/01	-	LR	MA EPH 98-1
Chloro-octadecane Aliphatic (%SR) Ortho-Terphenyl Aromatic (%SR)	62	ug/Kg	0.	4/25/01		LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	92	ug/Kg	0.	4/25/01		LR.	MA EPH 98-1
2-Fluorobir-henyl Fractionation (%SR)	80	ug/Kg	0.	4/25/01		LR	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/25/01		LR	MA EPH 98-1
% Solids	86.2	%	8 9	4/25/01		RTW	SM2540 B Mod

Client Id: S-27

Collection Date: 4/24/01

arameter	٠,		Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation							75	
OC Extraction (solid)	1		Field ext			4/24/01		SW846 5035
Volatile Organic Compounds	+						541	
PH Aliphatics/Aromatics							•	
C5-C8 Aliphatic Hydrocarbons	8 50	30	Below det lim	mg/Kg	1.05	4/25/01	RLJ	MA VPH 97-
C9-C12 Aliphatic Hydrocarbons	-		Below det lim	mg/Kg	0.350	4/25/01	RLJ	MA VPH 97-
C9-C10 Aromatic Hydrocarbons	1	25	Below det lim	mg/Kg	0.350	4/25/01	RLJ	MA VPH 97-
Unadjusted C5-C8 Aliphatics		(V)	Below det lim	mg/Kg	1.05	4/25/01	RLJ	MA VPH 97-
Unadjusted C9-C12 Aliphatics		2000	Below det lim	mg/Kg	0.350	4/25/01	RLJ	MA VPH 97-
Carbon Chain Dilution Factor	.*	100	50	mg/Kg	0.	4/25/01	RLJ	MA VPH 97-
VPH Target Analytes		100						
Benzene		93	Below det lim	ug/Kg	70	4/25/01	RLJ	MA VPH 97-
Toluene	55	36	Below det lim	ug/Kg	70	4/25/01	RLJ	MA VPH 97-
Ethylbenzene			Below det lim	ug/Kg	70	4/25/01	RLJ	MA VPH 97-
m,p-Xylenes	a		Below det lim	ug/Kg	140	4/25/01	RLJ	MA VPH 97-
o-Xylene		1. 18	Below det lim	ug/Kg	70	4/25/01	RLJ	MA VPH 97-
Naphthalene			Below det lim	ug/Kg	70	4/25/01	RLJ	MA VPH 97-
Methyl-tert-butyl ether (MTBE)	6.		Below det lim	ug/Kg	70	4/25/01	RLJ	MA VPH 97-
2,5-Dibromotoluene (%SR) PID			107	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
2,5-Dibromotoluene (%SR) FID			106	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
2,5-Dibromotoluene (%SR) GCM	1S		NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97
4-Bromofluorobenzene (%SR) G	CMS		NA	ug/Kg	0.	4/25/01	RLJ	MA VPH 97
Target Analytes Dilution Factor			50	ug/Kg	0.	4/25/01	RLJ	MA VPH 97-
TPH Preparation							75	
Ultrasonic Extraction			Completed	-		4/25/01	RTW	SW846 3550
Petroleum Hydrocarbon Analy EPH Aliphatics/Aromatics	sis		4					
C9-C18 Aliphatic Hydrocarbons			Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98
C19-C36 Aliphatic Hydrocarbon	S		Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98
C11-C22 Aromatic Hydrocarbon			Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98
Unadjusted C11-C22 Aromatics			Below det lim	mg/Kg	30	4/25/01	LR	MA EPH 98
Carbon Chain Dilution Factor			1	mg/Kg	0.	4/25/01	LR	MA EPH 98
EPH Target PAH Analytes			1.0		400		1000	
Naphthalene			Below det lim	ug/Kg	170	4/25/01	. LR	MA EPH 98
2-Methylmaphthalene			Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98
Acenaphthylene			Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98
Acenaphthene			Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98
Fluorene			Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98
Phenanthrene			Below det lim	ug/Kg	170	4/25/01	LR	MA EPH 98

Client Id: S-27

Collection Date: 4/24/01

arameter	3	Results	Units	PQL	Start Date		-3	Analyst	Method
EPH Target PAH Analytes								•	
Anthracene		Below det lim	ug/Kg	170	4/25/01			LR	MA EPH 98-1
luoranthene	TO 2	Below det lim	ug/Kg	170	4/25/01			LR	MA EPH 98-1
Pyrene		Below det lim	ug/Kg	170	4/25/01		50	LR	MA EPH 98-1
Benzo (a) anthracene	9	Below det lim	ug/Kg	170	4/25/01	1.5		LR	MA EPH 98-1
Chrysene	- 8	Below det lim	ug/Kg	170	4/25/01		46	LR	MA EPH 98-1
Benzo (b) fluoranthene		Below det lim	ug/Kg	170	4/25/01			LR	MA EPH 98-1
Benzo (k) fluoranthene	9	Below det lim	ug/Kg	170	4/25/01			LR	MA EPH 98-1
Benzo (a) pyrene	9	Below det lim	ug/Kg	170	4/25/01			LR	MA EPH 98-1
Indeno (1,2,3-cd) pyrene		Below det lim	ug/Kg	170	4/25/01			LR	MA EPH 98-1
Dibenzo (a, 1) anthracene		Below det lim	ug/Kg	170	4/25/01			LR	MA EPH 98-1
Benzo (g,h,:) perylene		Below det lim	ug/Kg	170	4/25/01			LR	MA EPH 98-1
-Chloro-octadecane Aliphatic (%SR)		68	ug/Kg	0.	4/25/01	+	4	LR	MA EPH 98-1
-Chloro-octadecane Aliphatic (%SR) Ortho-Terphenyl Aromátic (%SR)		57	ug/Kg	0.	4/25/01		-02	LR	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)		86	ug/Kg	0.	4/25/01			LR	MA EPH 98-1
2-Fluorobir henyl Fractionation (%SR)		74	ug/Kg	0.	4/25/01		•	LR	MA EPH 98-1
Target Analyte Dilution Factor	36	1	ug/Kg	0.	4/25/01			LR	MA EPH 98-1
% Solids		79.3	%		4/25/01			RTW	SM2540 B Mod

Client Id: S-27

Collection Date: 4/24/01

Matrix	□ Aqueous	BSoil □ Sediment □ Other:						
Containers	Satisfacto	ory Broken Leaking						
Aqueous Prese	rvative E	DAVA □ pH≤2 □ pH>2 □ pH adjusted to ≤2 in lab Comment:						
Temperature	Received	on ice Received cold Received ambient Recorded temper	ature: 1-7°0					
he following o	utlines the con	dition of all VPH samples contained within this report upon laboratory rec	eipt.					
Matrix	☐ Aqueous	☐ Soil ☐ Sediment ☐ Other:						
Containers	Satisfacto	ory Broken Leaking						
	Aqueous	□ N/A □ pH≤2 □ pH>2 Comment:						
Sample		□ N/A □ Samples NOT received in Methanol or air-tight container	ml Methanol/e soil					
Preservative	Soil or	Samples received in Methanol covering soil onot covering soil	mi Methanol/g soil					
	Sediment	- Dampies received in received covering son - not covering son	Other					
Temperature	Sediment	☐ Sample received in air-tight container:	Other:					
ere any signific ere all QA/QC	procedures for	□ Sample received in air-tight container:  I on ice □ Received cold □ Received ambient □ Recorded temper  Illowed as required by the VPH method? Yes □ No □  ons made to the VPH method, as specified in Section 11.3? No * see below the section by the EPH method? Yes □ No □ □	□ Other:  ature: \-\overline{-\overline{\chi}^{\chi}} w					
ere all QA/QC ere any signific ere all QA/QC ere any signific	procedures for	□ Sample received in air-tight container:  I on ice □ Received cold □ Received ambient □ Recorded temper  Illowed as required by the VPH method? Yes □ No □  Illowed as required by the EPH method? Yes □ No □  Illowed as required by the EPH method? Yes □ No □  Illowed as required by the EPH method? Yes □ No □  In Incompany the Incompany temperature of the Incompa	Other:  ature: \-\^\columbda					
ere all QA/QC ere any signific ere all QA/QC ere any signific ere all perform (es, if P)D and FIE	procedures for cant modification procedures for cant modification cant modification cance/acceptant surrogate recovery	□ Sample received in air-tight container:  I on ice □ Received cold □ Received ambient □ Recorded temper  Illowed as required by the VPH method? Yes □ No □  ons made to the VPH method, as specified in Section 11.3? No * see below the section by the EPH method? Yes □ No □ □	Other:  ature: \-\^\colonc					
ere all QA/QC ere any signific ere all QA/QC ere any signific ere all perform (es, if PID and FID Sample's) was run	procedures for cant modification ance/acceptant surrogate recover via GCMS using	□ Sample received in air-tight container:  I on ice □ Received cold □ Received ambient □ Recorded temper  Illowed as required by the VPH method? Yes □ No □  Illowed as required by the EPH method? Yes □ No □  Illowed as required by the EPH method? Yes □ No □  Ions made to the EPH method, as specified in Section 11.3? Yes ** see belowers and to the EPH method, as specified in Section 11.3? Yes ** see belowers standards for required QA/QC procedures achieved? Yes □ No □  It is are listed as n/a, then that sample was run via GCMS using all QC criteria specified in the content of the cont	□ Other:  ature:					



## SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

## Laboratory Report Supplement <u>References</u>

SW 846	The AMARIA SECTION OF THE WAY THE AND ADDRESS OF THE ADDRESS OF TH	
	Test Methods for Evaluating Solid Waste. Third edition, 1998	
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean V	Vater Act
140 CFR 141	National Primary Drinking Water Regulations	
40 CFR 143	National Secondary Drinking Water Regulations	
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ASTM D 3328	Standard Methods for the Comparison of Waterborne Petroleum Oils by Gas Chromatog	graphy
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EPA 600/4-79-012	Quality Assurance Handbook for Analytical Quality Control in Water and Wastewater Lal	foratories
EPA 600/4-79-019	Handbook for Analytical Quality Control in Water and Wastewater Laboratories	283
EPA 600/4-79-020	Method for the Chemical Analysis of Water and Wastes	3
EPA 600/4-82-057	Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater	1
EPA 600/4-85/056	Choosing Cost-Effective QA/QC Programs for Chemical Analysis	
EPA 600/4-85/056 EPA 600/4-88/039	Method for the Determination of Organic Compounds in Drinking Water	1.
CT ETPH	Analysis of Extractable Total Petroleum Hydrocarbons (ETPH)	7.0
MADEP EPH	Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)	59 85
	Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)	9404
QAMS 004/80	Guidelines and Specifications for Preparing Quality Assurance Program Plans, USEPA Monitoring System and Quality Assurance	Office of

## Acronyms & Abbreviations

Oil Spill Identification System

GC-D-52-77

	AA	Atomic Absorption	MS	Matrix Spike	
ı	ASTM	American Society for Testing and Materials	MSD	Matrix Spike Duplicate	
	BOD	Biological Oxygen Demand	NTU	Nephelometric Turbidity Units	
	°C	degree(s) Celsius	PAHs	Polynuclear Aromatic Hydrocarbons	
	COD	Chemical Oxygen Demand	PCBs	Polychlorinated Biphenyls	
	CMR	Code of Massachusetts Regulations	PID	Photo Ionization Detector	
_	DEP	Department of Environmental Protection	PQL	Practical Quantitation Limit	
K	DI	De-ionized	R	Recovery (%R: Percent Recovery)	
H.	DO	Dissolved Oxygen	RSD	Relative Standard Deviation	
	EPA	Environmental Protection Agency	SM	Standard Method	,
n	EPH	Extractable Petroleum Hydrocarbons	SR	Surrogate Recovery (%SR)	
U	FID	Flame Ionization Detector	sw	Solid Waste	
	GC	Gas Chromatograph	THM	Trihalomethane(s)	
n	GC/MS	Gas Chromatograph / Mass Spectrometer	TOC	Total Organic Carbon	
U	ICP	Inductively Coupled Plasma	TOX	Total Organic Halogen	
	Id	Identification	TPH	Total Petroleum Hydrocarbons	
1	MCL	Maximum Contaminant Level	VOC	Volatile Organic Compound	
	MDL	Minimum Detection Limit	VPH -	Volatile Petroleum Hydrocarbons	



HANIBAL TECHNOLOGY Penturing.

# CHAIN OF CUSTODY RECORD

Special Handling:

D Standard TAT - 7 to 10 business, days TA - 1 to 10 business, days TAT - Date Needed 1 Volet 1 IPM All TATs subject to laboratory approval. · Min. 24-hour notification needed for rushes. · All samples are disposed of after 60 days

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HANIBAL TECHNOLOGY

# CHAIN OF CUSTODY RECORD

Special Handling:

All TATs subject to laboratory approval Min. 24-hour notification needed for rushes.

All samples are disposed of after 60 days

unless otherwise instructed. 3997

Time: 8,36 \$ State: Notes Are Win Side Location: W, Spring Fre Analyses Received by: Project No .: Sampler(s): Site Name: X X X -Containers: # of Plastic # of Clear Glass RON: Relinquished by: # of Amber Glass slaiV AOV 10 # Preservative 7 P.O. No.: /399 S 6=Ascorbic Acid Matrix Invoice To: Lype B WW=Wastewater SL=Sludge A=Air Time: 1=Na<sub>2</sub>S2O<sub>3</sub> 2=HCl 3=H<sub>2</sub>SO<sub>4</sub> 4=HNO<sub>3</sub> 5=NaOH X3= 10/12/1/01 C=Composite DW=Drinking Water GW=Groundwater Date: O=Oil SW= Surface Water SO=Soil ☐ E-mail results when available to Fax results when available to ( 8= NaHSO4 9= G=Grab Sample Id: X2= 52-5 52-5 22-5 42-5 12-5 12-5 1215 527 Project Mgr.: Report To: 7=CH,0H Lab Id:

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## Featuring

### HANIBAL TECHNOLOGY

Massachusetts Certification # M-MA138 Rhode Island # 98 Maine # MA138 Florida # E87600 / 87562 New Hampshire # 2538 Connecticut # PH-0777 New York # 11393

ECS, Inc. 588 Silver Street Agawam, MA 01001

Attn: Chris Parent

Client Project Number: 13997



Monday, April 30, 2001

Report Status:

Final Report

☐ Re-issued Report

☐ Revised Report

Location: Wayside Ave. - W. Spfld., MA

Laboratory ID	Client Sample ID	Analyses Requested
AC42819	S 31	% Solids
	**	VOC Extraction (solid)
		VPH Aliphatics/Aromatics
		VPH Target Analytes
	×	Ultrasonic Extraction
		EPH Aliphatics/Aromatics
		EPH Target PAH Analytes
AC42820	S 32	% Solids
		VOC Extraction (solid)
		VPH Aliphatics/Aromatics
*		VPH Target Analytes
		Ultrasonic Extraction
		EPH Aliphatics/Aromatics
		EPH Target PAH Analytes
AC42821	S 37	% Solids
		VOC Extraction (solid)
		VPH Aliphatics/Aromatics
		VPH Target Analytes
		Ultrasonic Extraction
nu nu		EPH Aliphatics/Aromatics
		EPH Target PAH Analytes
AC42822	S 40	% Solids
		VOC Extraction (solid)
		VPH Aliphatics/Aromatics
		VPH Target Analytes
14		Ultrasonic Extraction
		EPH Aliphatics/Aromatics



## Featuring HANIBAL TECHNOLOGY

Client Project Number: 1

13997

Location: Wayside Ave. - W. Spfld., MA

Laboratory ID	Client Sample ID	Analyses Requested
AC42822	S 40	EPH Target PAH Analytes
		VOCs by GC/MS
AC42823	Trip 1	VPH Aliphatics/Aromatics
	000000	VPH Target Analytes

I attest that all information contained within this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method and meet the requirements of NELAC including any data obtained from a subcontract laboratory. Please note that all solid matrix sample results are calculated on a dry weight basis unless otherwise specified.

This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

Hanjbal . Tayeh

President/Laboratory Director

Laboratory Report

Location: Wayside Ave. - W. Spfld., MA

Client: ECS

Lab ID No: AC42819

Client Id: S 31

Client Project No: 13997

Submittal Date: 4/25/01 Collection Date: 4/25/01

					10/21	
Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/25/01		SW846 5035
Volatile Organic Compounds						
VPH Aliphotics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.675	4/30/01	GW	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.225	4/30/01	GW	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.225	4/30/01	GW	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	0.675	4/30/01	GW	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.225	4/30/01	GW.	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/30/01	GW	MA VPH 97-12
VPH Target Analytes					**	
Benzene	Below det lim	ug/Kg	45	4/30/01	GW	MA VPH 97-12
Toluene	Below det lim	ug/Kg	45	4/30/01	GW	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	45	4/30/01	GW	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	90	4/30/01	GW:	MA VPH 97-12
<b>B</b> o-Xylene	Below det lim	ug/Kg	45	4/30/01	GW	MA VPH 97-12
_ Naphthalene	Below det lim	ug/Kg	45	4/30/01	GW	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	45	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID 2,5-Dibromotoluene (%SR) GCMS	87	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	86	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/26/01	RT	SW846 3550B
Petroleum Hydrocarbon Analysis						
EPH Aliphatics/Aromatics						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/27/01	MSL	MA EPH 98-1
EPH Target PAH Analytes Naphthalene						
Naphthalene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
2-Methylnaphthalene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1

Lab ID No: AC42819 Client Id: S 31 Collection Date: 4/25/01

					1 1 1 1 1 1	
Parameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes						
Acenaphthylene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	140	4/27/01	MSĻ	MA EPH 98-1
Anthracene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Fluoranthene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Benzo (a) authracene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Indeno (1,2.3-cd) pyrene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	140	4/27/01	MSL	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	57	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	66	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	75	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	88	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR) Target Analyte Dilution Factor	1	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
% Solids	92.5	%		4/25/01	RT	SM2540 B Mo

Client Id: S 32

Collection Date: 4/25/01

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
OC Extraction (solid)	Field ext			4/25/01		SW846 5035
Volatile Organic Compounds						
PH Aliphatics/Aromatics				20		
C5-C8 Aliphatic Hydrocarbons	5.9	mg/Kg	3.49	4/30/01	GW	MA VPH 97-12
C9-C12 Alir hatic Hydrocarbons	14	mg/Kg	1.16	4/30/01	GW	MA VPH 97-12
29-C10 Aromatic Hydrocarbons	18	mg/Kg	1.16	4/30/01	GW	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	7.7	mg/Kg	3.49	4/30/01	GW	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	32	mg/Kg	1.16	4/30/01	GW	MA VPH 97-12
Carbon Chain Dilution Factor	200	mg/Kg	0.	4/30/01	GW	MA VPH 97-12
VPH Target Analytes					141	
Benzene	Below det lim	ug/Kg	230	4/30/01	GW	MA VPH 97-12
Toluene	Below det lim	ug/Kg	230	4/30/01	GW	MA VPH 97-12
Ethylbenzere	Below det lim	ug/Kg	230	4/30/01	GW	MA VPH 97-12
n,p-Xylenes	1,800	ug/Kg	470	4/30/01	GW	MA VPH 97-12
o-Xylene	880	ug/Kg	230	4/30/01	GW	MA VPH 97-12
Naphthalene	820	ug/Kg	230	4/30/01	GW	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	230	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
12,5-Dibromotoluene (%SR) FID	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	78	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	90	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
Target Analytes Dilution Factor	200	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
TPH Preparation		8.				
Ultrasonic Extraction	Completed			4/26/01	RT.	SW846 3550B
Petroleum Hydrocarbon Analysis						
EPH Aliphatics/Aromatics			-			
C9-C18 Aliphatic Hydrocarbons	81	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	32	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
C11-C22 Aromatic Hydrocarbons Unadjusted C11-C22 Aromatics	104	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
	107	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
Carbon Chain Dilution Factor	1	mg/Kg	0.	4/27/01	MSL	MA EPH 98-1
EPH Target PAH Analytes		-				
Naphthalere	720	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
2-Methylnsphthalene	2,200	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Fluorene Phenanthrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Phenanthrene	280	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1

Client Id: S 32

Collection Date: 4/25/01

arameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes						
luoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
yrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	76	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR)	74	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Ortho-Terphenyl Aromatic (%SR) 2-Bromonaphthalene Fractionation (%SR)	106	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	104	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
% Solids	80.4	%		4/25/01	RT	SM2540 B Mod

Client Id: S 37

Collection Date: 4/25/01

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/25/01		SW846 5035
Volatile Organic Compounds						
VPH Aliphatics/Aromatics			2004	17 12 4 LT LANGE - 17	35000000	
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.915	4/30/01	GW	MA VPH 97-1
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.305	4/30/01	GW	MA VPH 97-1
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.305	4/30/01	GW	MA VPH 97-
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	0.915	4/30/01	GW	MA VPH 97-
Unadjusted C9-C12 Aliphatics	Below det lim	mg/Kg	0.305	4/30/01	GW	MA VPH 97-
Carbon Chain Dilution Factor	50	mg/Kg	0.	4/30/01	GW	MA VPH 97-
VPH Target Analytes						
Benzene	Below det lim	ug/Kg	61	4/30/01	GW	MA VPH 97-
Toluene	Below det lim	ug/Kg	61	4/30/01	GW	MA VPH 97-
Ethylbenzene	Below det lim	ug/Kg	61	4/30/01	GW	MA VPH 97-
m,p-Xylenes	Below det lim	ug/Kg	120	4/30/01	GW	MA VPH 97-
o-Xylene	Below det lim	ug/Kg	61	4/30/01	GW	MA VPH 97-
Naphthalene	Below det lim	ug/Kg	61	4/30/01	GW	MA VPH 97-
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	61	4/30/01	GW	MA VPH 97-
2,5-Dibromotoluene (%SR) PID	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-
2,5-Dibromotoluene (%SR) FID	na	ug/Kg	0.	4/30/01	GW.	MA VPH 97-
2,5-Dibromotoluene (%SR) GCMS	84	ug/Kg	0.	4/30/01	GW	MA VPH 97-
4-Bromofluorobenzene (%SR) GCMS	86	ug/Kg	0.	4/30/01	GW	MA VPH 97-
Target Analytes Dilution Factor	50	ug/Kg	0.	4/30/01	GW	MA VPH 97-
TPH Preparation	90	e 2				
Ultrasonic Extraction	Completed			4/26/01	RT	SW846 3550
Petroleum Hydrocarbon Analysis						
EPH Aliphatics/Aromatics				14		
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98
Unadjusted C11-C22 Aromatics	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98
Carbon Chain Dilution Factor	1	mg/Kg	O.	4/27/01	MSL	MA EPH 98
EPH Target PAH Analytes						
Naphthalene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98
2-Methylnaphthalene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98
Acenaphthylene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98
Acenaphthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98
Fluorene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98
Phenanthrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98
Anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98

Client Id: S 37

Collection Date: 4/25/01

arameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes					12.5	
Fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
yrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (a) ar thracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (k) fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Вепло (а) рудене	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Dibenzo (a,lı) anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	82	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Prtho-Terphenyl Aromatic (%SR)	58	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	94	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	95	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	.0.	4/27/01	MSL	MA EPH 98-1
% Solids	84.4	%	ř	4/25/01	RT	SM2540 B Mod
			ă.			

Client Id: S 40

Collection Date: 4/25/01

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOC Preparation						
VOC Extraction (solid)	Field ext			4/25/01		SW846 5035
Volatile Organic Compounds						
VOCs by GC/MS						
Acetone	Below det lim	ug/Kg	7000	4/30/01	GW	SW846 8260B
Acrylonitrile	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Benzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Bromobenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Bromochloromethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Bromodichloromethane  Bromodichloromethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Bromoform	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Bromomethane	Below det lim	ug/Kg	140	4/30/01	GW	SW846 8260B
2-Butanone (MEK)	Below det lim	ug/Kg	3500	4/30/01	GW	SW846 8260B
n-Butylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
sec-Butylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
tert-Butylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Carbon disulfide	Below det lim	ug/Kg	350	4/30/01	GW	SW846 8260B
Carbon disulfide  Carbon tetrachloride	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Chlorobenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Chloroethane	Below det lim	ug/Kg	140	4/30/01	GW	SW846 8260B
Chloroform	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Chloromethane	Below det lim	ug/Kg	140	4/30/01	GW	SW846 8260B
2-Chlorotoluene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
4-Chlorotoluene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2-Dibromo-3-chloropropane (DBCP)	Below det lim	ug/Kg	140	4/30/01	GW	SW846 8260B
Dibromoch oromethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2-Dibromoethane (EDB)	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Dibromomethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Dibromomethane 1,2-Dichlorobenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,3-Dichlorobenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,4-Dichlorobenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Dichlorodifluoromethane	Below det lim	ug/Kg	140	4/30/01	GW	SW846 8260B
1,1-Dichloroethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2-Dichloroethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,1-Dichloroethene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
cis-1,2-Diciloroethene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
trans-1,2-Dichloroethene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2-Dichloropropane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,3-Dichloropropane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
2,2-Dichloropropane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,1-Dichloropropene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B

Client Id: S 40

Collection Date: 4/25/01

					11992	
Parameter	Results	Units	PQL	Start Date	Analyst	Method
VOCs by GC/MS						
cis-1,3-Dich oropropene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
trans-1,3-Dichloropropene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Ethylbenzen:	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Hexachlorobutadiene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
2-Hexanone (MBK)	Below det lim	ug/Kg	7000	4/30/01	GW	SW846 8260B
Isopropylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
4-Isopropyltoluene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Methyl-tert-outyl ether (MTBE)	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
4-Methyl-2-pentanone (MIBK)	Below det lim	ug/Kg	1400	4/30/01	GW	SW846 8260B
Methylene chloride	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Naphthalene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
n-Propylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Styrene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,1,1,2-Tetrachloroethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,1,2,2-Tetrachloroethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Tetrachlorosthene (PCE)	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Toluene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2,3-Trichlorobenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2,4-Trichlorobenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,1,1-Trichloroethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,1,2-Trich oroethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Trichloroethene (TCE)	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Trichlorofluoromethane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2,3-TrichToropropane	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,2,4-Trimethylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
1,3,5-Trimethylbenzene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
Vinyl chloride	Below det lim	ug/Kg	140	4/30/01	GW	SW846 8260B
m,p-Xylenes	Below det lim	ug/Kg	140	4/30/01	GW	SW846 8260B
o-Xylene	Below det lim	ug/Kg	70.0	4/30/01	GW	SW846 8260B
4-Bromofluorobenzene (%SR)	92	ug/Kg	0.000	4/30/01	GW	SW846 8260B
1,4-Difluorobenzene (%SR)	- 99	ug/Kg	0.000	4/30/01	GW	SW846 8260B
1,4-Difluorobenzene (%SR) Chlorobenzene-d5 (%SR)	97	ug/Kg	0.000	4/30/01	GW	SW846 8260B
VPH Aliphatics/Aromatics						
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/Kg	1.05	4/30/01	GW	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/Kg	0.350	4/30/01	GW	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/Kg	0.350	4/30/01	GW	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/Kg	1.05	4/30/01	GW	MA VPH 97-12
Unadjusteć C9-C12 Aliphatics	Below det lim	mg/Kg	0.350	4/30/01	GW	MA VPH 97-12
Carbon Chain Dilution Factor  VPH Target Analytes	50	mg/Kg	0.	4/30/01	GW	MA VPH 97-12
Benzene	Below det lim	ug/Kg	70	4/30/01	GW	MA VPH 97-13

Client Id: S 40

Collection Date: 4/25/01

Parameter	Results	Units	PQL	Start Date	Analyst	Method
VPH Target Analytes			1270		81	
Toluene	Below det lim	ug/Kg	70	4/30/01	GW	MA VPH 97-12
Ethylbenzene	Below det lim	ug/Kg	70	4/30/01	GW	MA VPH 97-12
m,p-Xylenes	Below det lim	ug/Kg	140	4/30/01	GW	MA VPH 97-12
o-Xylene	Below det lim	ug/Kg	70	4/30/01	GW	MA VPH 97-12
Naphthalene	Below det lim	ug/Kg	70	4/30/01	GW	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/Kg	70	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	na	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	87	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	91	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/Kg	0.	4/30/01	GW	MA VPH 97-12
TPH Preparation						
Ultrasonic Extraction	Completed			4/26/01	RT	SW846 3550B
Petroleum Hydrocarbon Analysis						
EPH Aliphatics/Aromatics	72772 V 1417	2.51	2012	300000		
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
C19-C36 A iphatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
C11-C22 A:omatic Hydrocarbons	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
Unadjusted C11-C22 Aromatics  Carbon Chain Dilution Factor	Below det lim	mg/Kg	30	4/27/01	MSL	MA EPH 98-1
	1	mg/Kg	0.	4/27/01	MSL	MA EPH 98-1
EPH Target PAH Analytes	in Edition of the North Control	Consumption of	Newson.	II W Metabook	States as to a	
Naphthalene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
2 Theaty maphamicie	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Acenaphthylene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Acenaphthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Fluorene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Phenanthrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (a) anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Chrysene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (k) iluoranthene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
Benzo (g,h,i) perylene	Below det lim	ug/Kg	170	4/27/01	MSL	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	57	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Ortho-Terr-henyl Aromatic (%SR)	59	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1

Client Id: S 40

Collection Date: 4/25/01

Parameter	Results	Units	PQL	Start Date	Analyst	Method
EPH Target PAH Analytes			82		200	
2-Bromonaphthalene Fractionation (%SR)	101	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	98	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
Target Analyte Dilution Factor	1	ug/Kg	0.	4/27/01	MSL	MA EPH 98-1
% Solids	80.5	%		4/25/01	RT	SM2540 B Mod

Lab ID No: AC42823 Client Id: Trip 1 Collection Date: 4/25/01 Matrix: Methanol

Parameter	Results	Units	PQL	Start Date		Analyst	Method
Volatile Organic Compounds VPH Aliphatics/Aromatics							
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/L	0.750	4/30/01	4	GW	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/L	0.250	4/30/01		GW	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/L	0.250	4/30/01		GW	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/L	0.750	4/30/01		GW	MA VPH 97-12
Unadjusted C9-C12 Aliphatics Carbon Chan Dilution Factor	Below det lim	mg/L	0.250	4/30/01		GW	MA VPH 97-12
Carbon Chain Dilution Factor	50	mg/L	0.	4/30/01		GW	MA VPH 97-12
VPH Target Analytes							
Benzene	Below det lim	ug/L	50	4/30/01		GW	MA VPH 97-12
Toluene	Below det lim	ug/L	50	4/30/01		GW	MA VPH 97-12
Ethylbenzer.e	Below det lim	ug/L	50	4/30/01		GW	MA VPH 97-12
m,p-Xylene:	Below det lim	ug/L	100	4/30/01	80	GW	MA VPH 97-12
o-Xylene	Below det lim	ug/L	50	4/30/01		GW	MA VPH 97-12
Naphthalene	Below det lim	ug/L	50	4/30/01		GW	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/L	50	4/30/01	19	GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) PID	na	ug/L	0.	4/30/01		GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	na	ug/L	0.	4/30/01		GW	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	86	ug/L	0.	4/30/01	60	GW	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	90	ug/L	0.	4/30/01		GW	MA VPH 97-12
Target Analytes Dilution Factor	50	ug/L	0.	4/30/01	.+	GW	MA VPH 97-12

Lab ID No: AC42823 Client Id: Trip 1 Collection Date: 4/25/01

Matrix: Methanol

rameter		Results	Units	PQL	Start Date	Analyst	Method
The following or	utlines the cor	ndition of all EPH samples	contained with	in this rep	port upon laboratory	receipt.	
Matrix	☐ Aqueous	□ Soil □ Sediment	Other;				
Containers	☐ Satisfact	ory Broken Leak	ing			2000	
Aqueous Prese	rvative	N/A □ pH≤2 □ pH	>2	justed to	≤2 in lab Commer	nt: -	
Temperature	Received	on ice Received cold	☐ Receive	d ambien	Recorded temp	perature?°C	
The following o	utlines the cor	ndition of all VPH samples		nin this re	port upon laboratory	receipt.	
Matrix	□ Aqueous						
Containers	□ Satisfact		ring		(F) (F) (F)	1	
	Aqueous		pH>2 Com				
Sample	Soil or				or air-tight containe	mi Methano	l/g soil
Preservative	Sediment	Samples received in N	fethanol cover	ing soil	not covering soil	1:1 +/- 25 D Other: \	
		☐ Sample received in air				AC4283	0
Temperature	Receive	d on ice Received cold	I □ Receive	d ambien	t Recorded tem	perature: 3°	
Were any signific Were all QA/QC Were any signific	cant modificat procedures for cant modificat	ollowed as required by the V tions made to the VPH meth followed as required by the F tions made to the EPH meth ace standards for required Q	od, as specific PH method? od, as specific	ed in Secti Yes d in Secti	on 11.3? No * see be No on 11.3? Yes ** see	below	
* Yes, if PID and FII	D surrogate recov	eries are listed as n/a, then that sar g all QC criteria specified in the	nple was run via				
I attest that based	d upon my inq	uiry of those individuals im	mediately resp	onsible fo	or obtaining the infor	mation, the	
material contains	ed in this repo	rt is, to the best of my know	ledge and beli	ef, accura	te and complete.		
Reviewed by			Vali	dated by:	1		4/30/01
Quality Ser	vice/Quality A	Assurance Depts.		Présiden	t/Laboratory Director		



## SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

## Laboratory Report Supplement <u>References</u>

SW 846	Test Methods for Evaluating Solid Waste. Third edition, 1998	
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Wat	er Act
40 CFR 141	National Primary Drinking Water Regulations	
40 CFR 143	National Secondary Drinking Water Regulations	
40 CFR 160	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Good Laboratory Practice Star	ndards
APHA-AWWA-WPCF	Standard Methods for the Examination of Water and Wastewater. 19th edition, 1995	10 KI
ASTM D 3328	Standard Methods for the Comparison of Waterborne Petroleum Oils by Gas Chromatograp	phy
EPA 540/G-87/003	Data Quality Objectives for Remediation Response Activities, Development Process	
EPA 600/4-79-012	Quality Assurance Handbook for Analytical Quality Control in Water and Wastewater Labora	atories
EPA 600/4-79-019	Handbook for Analytical Quality Control in Water and Wastewater Laboratories	88
EPA 600/4-79-020	Method for the Chemical Analysis of Water and Wastes	£
EPA 600/4-82-057	Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater	* -
EPA 600/4-85/056	Choosing Cost-Effective QA/QC Programs for Chemical Analysis	
EPA 600/4-88/039	Method for the Determination of Organic Compounds in Drinking Water	2 1
CT ETPH	Analysis of Extractable Total Petroleum Hydrocarbons (ETPH)	1
MADEP EPH	Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)	2002
MADEP VPH	Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)	5 5
QAMS 004/80	Guidelines and Specifications for Preparing Quality Assurance Program Plans, USEPA Of Monitoring System and Quality Assurance	fice of

## Acronyms & Abbreviations

Oil Spill Identification System

GC-D-52-77

ı	AA	Atomic Absorption	MS	Matrix Spike
ı	ASTM	American Society for Testing and Materials	MSD	Matrix Spike Duplicate
	BOD	Biological Oxygen Demand	NTU	Nephelometric Turbidity Units
1	°C	degree(s) Celsius	PAHs	Polynuclear Aromatic Hydrocarbons
	COD	Chemical Oxygen Demand	PCBs	Polychlorinated Biphenyls
	CMR	Code of Massachusetts Regulations	PID	Photo Ionization Detector
	DEP	Department of Environmental Protection	PQL	Practical Quantitation Limit
	DI	De-ionized	R	Recovery (%R: Percent Recovery)
	DO	Dissolved Oxygen	RSD	Relative Standard Deviation
	EPA	Environmental Protection Agency	SM	Standard Method
	EPH	Extractable Petroleum Hydrocarbons	SR	Surrogate Recovery (%SR)
	FID	Flame Ionization Detector	sw	Solid Waste
	GC	Gas Chromatograph	THM	Trihalomethane(s)
	GC/MS	Gas Chromatograph / Mass Spectrometer	TOC	Total Organic Carbon
	ICP	Inductively Coupled Plasma	TOX	Total Organic Halogen
	Id	Identification	TPH	Total Petroleum Hydrocarbons
	MCL	Maximum Contaminant Level	VOC	Volatile Organic Compound
	MDL	Minimum Detection Limit	VPH .	Volatile Petroleum Hydrocarbons



Report To:

ECS

## CHAIN OF CUSTODY RECORD

Page / of 2

Special Handling:  Standard TAT - 7 to 10 business days  Rush TAT - Date Needed:				
	All TATe are enhance to laboratory approval	Rush TAT - Date Needed:	☐ Standard TAT - 7 to 10 business days,	Special Handling:

All TATs are subject to laboratory approval Noon

All samples are disposed of after 60 days unless otherwise instructed.

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AB 42819.

Lab Id:

Sample Id:

Date:

Time:

G=Grab

C=Composite

SW= Surface Water

SO=Soil X2=

SL=Sludge

GW=Groundwater

WW=Wastewate 0=0il

ī

DW=Drinking Water

8=CH,OH 9= NaHSO, 10=

I=Na2S2O3 Project Mgr.:

2=HC1 3=H2SO4

4-HNO3

5=NaOH

AB ' AB.

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Additional Instructions:

Fax results when available to

Officen - Ag Ma Setts - 4 - 700-90 12 - Eax 413-789-4076



## CHAIN O

	H CI STODY RECORD		
All TATs are subject to laboratory approval.	☐ Rush TAT - Date Needed:	☐ Standard TAT - 7 to 10 business days	Special Handling:

		_	
<ul> <li>Min 24-hour notification is needed for rushes.</li> </ul>	<ul> <li>All TATs are subject to laboratory approval.</li> </ul>	Rush TAT - Date Needed:	

- ) days

after 60	unless otherwise instructed.	All samples are disposed of
		of after 60

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1=Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 2= 8=CH <sub>3</sub> OH 9=	2=HCl 3=H <sub>2</sub> SO <sub>4</sub> 9= NaHSO <sub>4</sub> 10=	4=HNO <sub>3</sub>	5=NaOH 6=Asco	6=Ascorbic Acid	***	Cont	Containers		Anal	Analyses:	7.5 V.	Notes:	
6 1	×m	GW=Groundwater WW: O=Soil SL=Sludge O: 2= X3=	F 40 40-4			r Glass				*			
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### Featuring

## HANIBAL TECHNOLOGY

Massachusetts Certification # M-MA138 Rhode Island # 98 Maine # MA138 Florida # E87600 / 87562 New Hampshire # 2538 Connecticut # PH-0777 New York # 11393

ECS, Inc. 588 Silver Street Agawam, MA 01001

nela

Wednesday, May 16, 2001

Report Status:

- Final Report
- ☐ Re-issued Report
- ☐ Revised Report

Attn: Chris Parent

Client Project Number: 13997

Location: 115 Wayside Ave-W. Spfld, MA

Laboratory ID	Client Sample ID	Analyses Requested
AC45715	MW-3	Separatory Funnel Extraction
		EPH Aliphatics/Aromatics
		EPH Target PAH Analytes
		VPH Aliphatics/Aromatics
	50	VPH Target Analytes
in .	100	VOCs by GC/MS
AC45716	MW-2	Separatory Funnel Extraction
		EPH Aliphatics/Aromatics
		EPH Target PAH Analytes
45		VPH Aliphatics/Aromatics
		VPH Target Analytes
-		VOCs by GC/MS
AC45717	Trip	VPH Aliphatics/Aromatics
		VPH Target Analytes
		VOCs by GC/MS



## Featuring HANIBAL TECHNOLOGY

Client Project Number: 13997

Location: 115 Wayside Ave-W. Spfld, MA

Laboratory ID

Client Sample ID

Analyses Requested

I attest that all information contained within this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method and meet the requirements of NELAC including any data obtained from a subcontract laboratory. Please note that all solid matrix sample results are calculated on a dry weight basis unless otherwise specified.

This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

Hanibal C. T

President/Laboratory Director

Laboratory Report

Location: 115 Wayside Ave-W. Spfld, MA

Client: ECS

Lab ID No: AC45715 Client Id: MW-3 Client Project No: 13997 Submittal Date: 5/9/01 Collection Date: 5/9/01 Matrix: Ground Water

Parameter	Results	Units	PQL	Start Date		Analyst	Method
Volatile Organic Compounds				i v	111	(#1	
VOCs by GC/MS						* 1	
Acetone	Below det lim	ug/L	100.0	5/14/01		RLJ	SW846 8260
Acrylonitrile	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
Benzene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
Bromobenzene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
Bromochloromethane	Below det lim	ug/L	1.0	5/14/01	30	RLJ	SW846 8260
Bromodichloromethane	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
Bromoform	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
Bromomethane	Below det lim	ug/L	2.0	5/14/01		RLJ	SW846 8260
2-Butanone (MEK)	Below det lim	ug/L	50.0	5/14/01	2	RLJ	SW846 8260
n-Butylbenzene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
sec-Butylbenzene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
tert-Butylbenzene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
Carbon disulfide	Below det lim	ug/L	5.0	5/14/01		RLJ	SW846 8260
Carbon tetrachloride	Below det lim	ug/L	1.0	5/14/01		RLJ.	SW846 8260
Chlorobenzene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
Chloroethane	Below det lim	ug/L	2.0	5/14/01		RLJ	SW846 8260
Chloroform	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
Chlorometiane	Below det lim	ug/L	2.0	5/14/01	3	RLJ	SW846 8260
2-Chlorotoluene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
4-Chlorotoluene	Below det lim	ug/L	1.0	5/14/01	3	RLJ	SW846 8260
1,2-Dibrorao-3-chloropropane (DBCP)	Below det lim	ug/L	2.0	5/14/01		RLJ	SW846 8260
Dibromochloromethane	Below det lim	ug/L	1.0	5/14/01	59	RLJ	SW846 8260
1,2-Dibrornoethane (EDB)	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
Dibromomethane	Below det.lim	ug/L	1.0	5/14/01	$\alpha_{\rm e}$	⇔RLJ	SW846 8260
1,2-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
1,3-Dichlcrobenzene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
1,4-Dichlerobenzene	Below det lim	ug/L	1.0	5/14/01	7.1	RLJ	SW846 8260
Dichlorodifluoromethane	Below det lim	ug/L	2.0	5/14/01		RLJ	SW846 8260
1,1-Dichloroethane	Below det lim	ug/L	1.0	5/14/01	200	RLJ	SW846 8260
1,2-Dichloroethane	Below det lim	ug/L	1.0	5/14/01	83	RLJ	SW846 8260
1,1-Dichloroethene	Below det lim	ug/L	1.0	5/14/01	1	RLJ	SW846 8260
cis-1,2-Dichloroethene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8266
trans-1,2-Dichloroethene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260
1,2-Dichloropropane	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 826
1,3-Dichloropropane	Below det lim	ug/L	1.0	5/14/01	12	RLJ	SW846 826
2,2-Dichloropropane	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 826

Lab ID No: AC45715 Client Id: MW-3 Collection Date: 5/9/01 Matrix: Ground Water

Parameter ·	Results	Units	PQL	Start Date		Analyst	Method
VOCs by GC/MS	2247 4 (00/700 2 (10/200 10) (10/200 10) (10/200 10 (10/200 10 (10/200 10 (10/200 10 (10/200 10 (10/200 10 (10/200 10 (10/200 10 (10/200 10 (10/200 10 (10/200 10 (10/200 10 (10/200 10 (10/200 10 (10/200 10 (10/200 10 (10/200 10 (10					36	
1,1-Dichloropropene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
cis-1,3-Dichloropropene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
trans-1,3-Dichloropropene	Below det lim	ug/L	1.0	5/14/01		- RLJ ··	SW846 8260B
Ethylbenzene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
Hexachlorobutadiene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
2-Hexanone (MBK)	Below det lim	ug/L	100.0	5/14/01		RLJ	SW846 8260B
Isopropylbenzene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
4-Isopropyltoluene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/L	1.0	5/14/01	+	RLJ	SW846 8260B
4-Methyl-2-pentanone (MIBK)	Below det lim	ug/L	20.0	5/14/01		RLJ .	SW846 8260B
Methylene chloride	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
Naphthalene n-Propylherzene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
n-Propylbenzene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
Styrene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
1,1,1,2-Tetrachloroethane	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
1,1,2,2-Tetrachloroethane	Below det lim	ug/L	1.0	5/14/01		· RLJ ·	SW846 8260B
	Below det lim	ug/L	1.0	5/14/01			SW846 8260B
Tetrachloroethene (PCE) Toluene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
1,2,3-Trichlorobenzene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
1,2,4-Trichlorobenzene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
1,1,1-Trichloroethane	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
1,1,2-Trichloroethane	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
Trichloroethene (TCE)	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
Trichlorofluoromethane	Below det lim	ug/L	1.0	5/14/01			SW846 8260B
1,2,3-Trichloropropane	Below det lim		1.0	5/14/01	34		
1,2,4-Trimethylbenzene	Below det lim	ug/L			50	RLJ	SW846 8260B
1,3,5-Trimethylbenzene		ug/L	1.0	5/14/01	1.0	RLJ	SW846 8260B
	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
Vinyl chloride	Below det lim	ug/L	1.0	5/14/01	(0)	RLJ	SW846 8260B
m,p-Xylenes	Below det lim	ug/L	2.0	5/14/01		RLJ	SW846 8260B
o-Xylene	Below det lim	ug/L	1.0	5/14/01		RLJ	SW846 8260B
4-Bromofluorobenzene (%SR)	98	ug/L		5/14/01		RLJ	SW846 8260B
1,4-Difluorobenzene (%SR)	103	ug/L		5/14/01		RLJ	SW846 8260B
Chlorobenzene-d5 (%SR)	102	ug/L		5/14/01		RLJ	SW846 8260B
VPH Aliphatics/Aromatics	W. A	500000 <b>00</b>	0.000				
C5-C8 Aliohatic Hydrocarbons	Below det lim	mg/L	0.075	5/14/01		RLJ	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/L	0.025	5/14/01		RLJ	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/L	0.025	5/14/01		RLJ	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/L	0.075	5/14/01	+	RLJ	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/L	0.025	5/14/01		RLJ	MA VPH 97-12
Carbon Chain Dilution Factor	. 1	mg/L	0.	5/14/01		RLJ	MA VPH 97-12
VPH Target Analytes		2000					A 120 March 1997
Benzene	Below det lim	ug/L	5.0	5/14/01		RLJ	MA VPH 97-12
Toluene	Below det lim	ug/L	5.0	5/14/01		RLJ	MA VPH 97-12

Lab ID No: AC45715 Client Id: MW-3 Collection Date: 5/9/01 Matrix: Ground Water

arameter	Results	Units	PQL	Start Date	Analyst	Method
VPH Target Analytes					-	
Ethylbenzene	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-1
n,p-Xylenes	Below det lim	ug/L	10	5/14/01	RLJ	MA VPH 97-1
o-Xylene	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-1
Naphthalene	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-1
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-1
2,5-Dibromotoluene (%SR) PID	NA	ug/L	0.	5/14/01	RLJ .	MA VPH 97-1
2,5-Dibromotoluene (%SR) FID	NA	ug/L	0.	5/14/01	RLJ -	MA VPH 97-1
2,5-Dibromotoluene (%SR) GCMS	87	ug/L	0.	5/14/01	RLJ	MA-VPH 97-1
4-Bromofluorobenzene (%SR) GCMS	98	ug/L	0.	5/14/01	RLJ .	MA VPH 97-1
Target Analytes Dilution Factor	1	ug/L	0.	5/14/01	RLJ	MA VPH 97-1
TPH Preparation		- 8				
Separatory Funnel Extraction	Completed			5/14/01	NA	SW846 3510C
Petroleum Hydrocarbon Analysis						(4 ×
EPH Aliphatics/Aromatics	4 92		2.2			
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/L	0.2	5/15/01	MSL '	MA EPH 98-1
C19-C36 Aliphatic Hydrocarbons	Below det lim	mg/L	0.2	5/15/01		MA EPH 98-
C11-C22 Aromatic Hydrocarbons	Below det lim	mg/L	0.2	5/15/01	MSL	MA EPH 98-
Unadjusted C11-C22 Aromatics	Below det lim	mg/L	0.2	5/15/01	MSL	MA EPH 98-
Carbon Chain Dilution Factor	1	mg/L		5/15/01	MSL :	MA EPH 98-1
EPH Target PAH Analytes	1207-17 AVENUES OF	2233400	1000	WWW.Webs	E	3
Naphthalene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-
2-Methylnaphthalene	Below det lim	ug/L	5.0	. 5/15/01	MSL	MA EPH 98-
Acenaphthylene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-
Acenaphthene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-
Fluorene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-
Phenanthrene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Anthracene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-
Fluoranthene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-
Pyrene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-
Benzo (a) anthracene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Chrysene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-
Benzo (b) fluoranthene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-
Benzo (k) fluoranthene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Benzo (a) pyrene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Indeno (1,2,3-cd) pyrene	Below det lim	ug/L	5.0	5/15/01	MSL Y	MA EPH 98-1
Dibenzo (a,h) anthracene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-
Benzo (g,h,i) perylene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
1-Chloro-octadecane Aliphatic (%SR)	65	ug/L	0.	5/15/01	MSL	MA EPH 98-
Ortho-Terphenyl Aromatic (%SR)	67	ug/L	0.	5/15/01	MSL -	MA EPH 98-1
2-Bromonaphthalene Fractionation (%SR)	67	ug/L	0.	5/15/01	MSL	MA EPH 98-1
2-Fluorobiphenyl Fractionation (%SR)	74	ug/L	0.	5/15/01	MSL	MA EPH 98-1

Collection Date: 5/9/01
Matrix: Ground Water

Client Id: MW-3			Matrix: Ground Water							
Parameter	+ "20g . *	Results		Units	PQL	Start Date		Analyst	Method	
EPH Target PAH Analytes Target Analyte Dilution Factor	. 41 .	1		ug/L	0.	5/15/01	•	MSL	MA EPH 98-1	
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Lab ID No: AC45716 Client Id: MW-2

Parameter	Results	Units	PQL	Start Date	Analyst	Method
Volatile Organic Compounds						
VOCs by GC/MS	M make Kovinsa					
Acetone	Below det lim	ug/L	100.0	5/14/01	RLJ	SW846 8260F
Acrylonitrile	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260E
Benzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260E
Bromobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
Bromochloromethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
Bromodichloromethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
Bromoform	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
Bromomethane	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 82601
2-Butanone (MEK)	Below det lim	ug/L	50.0	5/14/01	RLJ	SW846 82601
n-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
sec-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
tert-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
Carbon disulfide Carbon tetrachloride	Below det lim	ug/L	5.0	5/14/01	RLJ	SW846 8260
Carbon tetrachloride	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260
Chlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260
Chloroethane	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260
Chloroforni	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260
Chloromethane	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260
2-Chlorotoluene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260
4-Chlorotoluene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260
1,2-Dibromo-3-chloropropane (DBCP)	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 82601
Dibromochloromethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
1,2-Dibromoethane (EDB)	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260
Dibromomethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
1,2-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
1,3-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
1,4-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
Dichlorodifluoromethane	Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260I
1,1-Dichloroethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
1,2-Dichloroethane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
1,1-Dichlcroethene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 82601
cis-1,2-Dichloroethene	9.2	ug/L	0.1	5/14/01	RLJ	SW846 8260
trans-1,2-Dichloroethene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260
1,2-Dichloropropane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260
1,3-Dichloropropane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260
2,2-Dichloropropane	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260
1,1-Dichloropropene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260
cis-1,3-Dichloropropene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260
trans-1,3-Dichloropropene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260
Ethylbenzene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260
Hexachlorobutadiene	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260

Lab ID No: AC45716 Client Id: MW-2

Parameter		Results	Units	PQL	Start Date	Analyst	Method
VOCs by GC/MS						10	
2-Hexanone (MBK)		Below det lim	ug/L	100.0	5/14/01	RLJ	SW846 8260B
sopropylbenzene		Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
4-Isopropyltoluene	-	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Methyl-tert-butyl ether (MTBE)		Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
4-Methyl-2-pentanone (MIBK)		Below det lim	ug/L	20.0	5/14/01	RLJ	SW846 8260B
Methylene chloride		Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Naphthalene	- 5	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
n-Propylberzene		Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Styrene	13	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,1,1,2-Tetrachloroethane		Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,1,2,2-Tetrachloroethane		Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Tetrachloroethene (PCE)		10	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Toluene		Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2,3-Trichlorobenzene		Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2,4-Trichlorobenzene	- 3	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,1,1-Trichloroethane		Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1.1.2 Tricklessethers	20	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Trichloroethene (TCE)	10.	3.1	ug/L	1.0	5/14/01	· RLJ	SW846 8260B
Trichlorofluoromethane		Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1.2.3-Trichloropropane		Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,2,3-Trichloropropane 1,2,4-Trimethylbenzene	4	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
1,3,5-Trimethylbenzene	52	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
Vinyl chloride		Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
m,p-Xylenes		Below det lim	ug/L	2.0	5/14/01	RLJ	SW846 8260B
o-Xylene	275	Below det lim	ug/L	1.0	5/14/01	RLJ	SW846 8260B
4-Bromoff iorobenzene (%SR)		100	ug/L		5/14/01	RLJ	SW846 8260E
1,4-Difluorobenzene (%SR)		103	ug/L		5/14/01	RLJ	SW846 8260E
Chlorobenzene-d5 (%SR)		103	ug/L		5/14/01	RLJ	SW846 8260E
VPH Aliphatics/Aromatics	-	103	ug/L		5/14/01	KES	5 11 540 52001
C5-C8 Aliphatic Hydrocarbons		Below det lim	mg/L	0.075	5/14/01	RLJ	MA VPH 97-1
C9-C12 Aliphatic Hydrocarbons		Below det lim	mg/L	0.025	5/14/01	RLJ	MA VPH 97-1
C9-C10 Aromatic Hydrocarbons	38	Below det lim	mg/L	0.025	5/14/01	RLJ	MA VPH 97-1
Unadjusted C5-C8 Aliphatics		Below det lim	mg/L	0.075	5/14/01	RLJ	MA VPH 97-1
Unadjusted C9-C12 Aliphatics		Below det lim	mg/L	0.025	5/14/01	RLJ	MA VPH 97-1
Carbon Chain Dilution Factor		1	mg/L	0.	5/14/01	RLJ	MA VPH 97-1
VPH Target Analytes		T. 100		0.	2,1,1,0,1	1	1122 111271
Benzene	-	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-1
Toluene	0	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-1
Ethylbenzene		Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-1
m,p-Xylenes	1	Below det lim	ug/L	10	5/14/01	RLJ	MA VPH 97-1
o-Xylene		Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-1
Naphthalene	-	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-1
Methyl-tert-butyl ether (MTBE)	19	Below det lim	ug/L	5.0	5/14/01	RLJ	MA VPH 97-1

Lab ID No: AC45716 Client Id: MW-2

Parameter	Results	Units	PQL	Start Date	Analy	st Method
VPH Target Analytes						
,5-Dibromotoluene (%SR) PID	NA	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) FID	NA	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	97	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
4-Bromofluorobenzene (%SR) GCMS	100	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
Target Analytes Dilution Factor	1	ug/L	0.	5/14/01	RLJ	MA VPH 97-12
1PH Preparation		+1				
Separatory Junnel Extraction	Completed			5/14/01	NA.	SW846 3510C
Petroleum Hydrocarbon Analysis EPH Aliphatics/Aromatics						
C9-C18 Aliphatic Hydrocarbons	Below det lim	mg/L	0.2	5/15/01	MSL	MA EPH 98-1
■	Below det lim	mg/L	0.2	5/15/01	MSL	and the second s
C19-C36 Aliphatic Hydrocarbons C11-C22 Aromatic Hydrocarbons	Below det lim	mg/L	0.2	5/15/01	MSL	
Unadjusted C11-C22 Aromatics	Below det lim	mg/L	0.2	5/15/01	MSL	
Carbon Chain Dilution Factor	1	mg/L		5/15/01	MSL	
EPH Target PAH Analytes				2.10 Page 2.10 Page	5,730	
Naphthaler.e	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
2-Methylnaphthalene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Acenaphthylene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Acenaphthene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Acenaphthene Fluorene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Phenanthrene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Anthracene	Below det lim	· ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Fluoranthene	Below det lim	· ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Pyrene	Below det lim	ug/L	5.0	5/15/01	MSL	
Benzo (a) anthracene	Below det lim	ug/L	5.0	5/15/01	MSL	
Chrysene	Below det lim	ug/L	5.0	5/15/01	MSL	MA EPH 98-1
Benzo (b) fluoranthene	Below det lim	ug/L	5.0	5/15/01	MSL	
Benzo (k) fluoranthene	Below det lim	ug/L	5.0	5/15/01	· MSI	
Benzo (a) pyrene	Below det lim	ug/L	5.0	5/15/01	MSL	
Indeno (1,2,3-cd) pyrene	Below det lim	ug/L	5.0	5/15/01	MSL	
Dibenzo (a,h) anthracene	Below det lim	ug/L	5.0	5/15/01	MSL	
Benzo (g,li,i) perylene	Below det lim	ug/L	5.0	5/15/01	MSL	
1-Chloro-octadecane Aliphatic (%SR)	55	ug/L	0.	5/15/01	MSI	
Ortho-Terphenyl Aromatic (%SR)	68	ug/L	0.	5/15/01	MSI	
2-Bromonaphthalene Fractionation (%SR)	72	ug/L	0.	5/15/01	MSI	
2-Fluorobiphenyl Fractionation (%SR)	81	ug/L	0.	5/15/01	MSI	
Target Analyte Dilution Factor	1	ug/L	0.	5/15/01	MSI	
	200		7.77			

Lab ID No: AC45717 Client Id: Trip

arameter	Results	Units	PQL	Start Date	Analyst	Method
Yolatile Organic Compounds					4	
VOCs by GC/MS		45	7775		000071	2000
Acetone	Below det lim	ug/L	100.0	5/14/01	. KW	SW846 8260E
Acrylonitrile	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260E
Benzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260F
Bromobenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260I
Bromochloromethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 82601
Bromodichloromethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 82601
Bromeform	Below det lim	ug/L	1.0	5/14/01	KW	SW846 82601
Bromomethane	Below det lim	ug/L	2.0	5/14/01	KW	SW846 82601
2-Butanone (MEK)	Below det lim	ug/L	50.0	5/14/01	KW	SW846 82601
n-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 82601
sec-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260]
tert-Butylbenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
Carbon disulfide	Below det lim	ug/L	5.0	5/14/01	KW	SW846 8260)
Carbon tetrachloride	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
Chlorobenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
Chloroethane	Below det lim	ug/L	2.0	5/14/01	KW	SW846 8260
Chloroform	Below det lim	ug/L	1.0	5/14/01	. KW	SW846 8260
Chloromethane	Below det lim	ug/L	2.0	5/14/01	KW	SW846 8260
2-Chloroto uene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
4-Chloroto uene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
1,2-Dibronio-3-chloropropane (DBCP)	Below det lim	ug/L	2.0	5/14/01	KW	SW846 8260
Dibromochloromethane	Below det lim	ug/L	1.0	5/14/01	. KW	SW846 8260
1,2-Dibromoethane (EDB)	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
Dibromomethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
1,2-Dichlo obenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
1,3-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
1,4-Dichlorobenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
Dichlorodifluoromethane	Below det lim	ug/L	2.0	5/14/01	KW	SW846 8260
1,1-Dichloroethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
1,2-Dichloroethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
1,1-Dichloroethene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
cis-1,2-Dichloroethene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
trans-1,2-Dichloroethene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
1,2-Dichloropropane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
1,3-Dichleropropane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
2,2-Dichleropropane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
1,1-Dichleropropene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
cis-1,3-Dichloropropene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
trans-1,3-Dichloropropene	Below det lim	ug/L	1.0	5/14/01	: KW	SW846 8260
Ethylbenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260
Hexachlorobutadiene	Below det lim	ug/L	1.0	5/14/01	ĸw	SW846 8260

Lab ID No: AC45717

Client Id: Trip

arameter	Results	Units	PQL	Start Date	Analyst	Method
VOCs by GC/MS						
-Hexanone (MBK)	Below det lim	ug/L	100.0	5/14/01	KW	SW846 8260B
sopropylbenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
4-Isopropyltoluene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Methyl-tert-outyl ether (MTBE)	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
4-Methyl-2-pentanone (MIBK)	Below det lim	ug/L	20.0	5/14/01	KW	SW846 8260B
Methylene chloride	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Naphthalene:	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
n-Propylber zene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Styrene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,1,1,2-Tetrachloroethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,1,2,2-Tetrachloroethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Tetrachloroethene (PCE)	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Tetrachloroethene (PCE) Toluene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,2,3-Trich orobenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,2,4-Trich orobenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,1,1-Trichloroethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,1,2-Trichloroethane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,1,2-Trichloroethane Trichloroethene (TCE)	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Trichlorofluoromethane	Below det lim	ug/L	1.0	5/14/01	KW.	SW846 8260B
1,2,3-Trichloropropane	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
1,2,3-Trichloropropane 1,2,4-Trimethylbenzene	Below det lim	ug/L	1.0	5/14/01	KW.	SW846 8260B
1,3,5-Trimethylbenzene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
Vinyl chloride	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
m,p-Xylenes	Below det lim	ug/L	2.0	5/14/01	KW	SW846 8260B
o-Xylene	Below det lim	ug/L	1.0	5/14/01	KW	SW846 8260B
4-Bromofhorobenzene (%SR)	89	ug/L		5/14/01	· KW	SW846 8260B
1,4-Difluorobenzene (%SR)	102	ug/L		5/14/01	KW	SW846 8260B
Chlorobenzene-d5 (%SR)	95	ug/L		5/14/01	KW	SW846 8260B
VPH Aliphatics/Aromatics		160 <del>7</del> 00001			100000	
C5-C8 Aliphatic Hydrocarbons	Below det lim	mg/L	0.075	5/14/01	KW	MA VPH 97-12
C9-C12 Aliphatic Hydrocarbons	Below det lim	mg/L	0.025	5/14/01	KW	MA VPH 97-12
C9-C10 Aromatic Hydrocarbons	Below det lim	mg/L	0.025	5/14/01	KW	MA VPH 97-12
Unadjusted C5-C8 Aliphatics	Below det lim	mg/L	0.075	5/14/01	. KW	MA VPH 97-12
Unadjusted C9-C12 Aliphatics	Below det lim	mg/L	0.025	5/14/01	KW	MA VPH 97-12
Carbon Chain Dilution Factor	1	mg/L	0.	5/14/01	KW	MA VPH 97-1
VPH Target Analytes					***************************************	
Benzene	Below det lim	ug/L	5.0	5/14/01	KW	MA VPH 97-12
Toluene	Below det lim	ug/L	5.0	5/14/01	KW	MA VPH 97-12
Ethylbenzene	Below det lim	ug/L	5.0	5/14/01	KW	MA VPH 97-12
m,p-Xyler.es	Below det lim	ug/L	10	5/14/01	KW	MA VPH 97-12
o-Xylene	Below det lim	ug/L	5.0	5/14/01	KW	MA VPH 97-12
Naphthalene	Below det lim	ug/L	5.0	5/14/01	KW	MA VPH 97-12
Methyl-tert-butyl ether (MTBE)	Below det lim	ug/L	5.0	5/14/01	KW	MA VPH 97-12

Lab ID No: AC45717 Client Id: Trip

Land to the second seco						
arameter	Results	Units	PQL	Start Date	Analyst	Method
VPH Target Analytes						et:
3,5-Dibromotoluene (%SR) PID	na	ug/L	0.	5/14/01	KW	MA VPH 97-12
,5-Dibromotoluene (%SR) PID ,5-Dibromotoluene (%SR) FID	na	ug/L	0.	5/14/01	KW	MA VPH 97-12
2,5-Dibromotoluene (%SR) GCMS	74	ug/L	0.	5/14/01	KW	MA VPH 97-12
-Bromofluorobenzene (%SR) GCMS	89	ug/L	0.	5/14/01	KW	MA VPH 97-12
Bromofluorobenzene (%SR) GCMS  Carget Analytes Dilution Factor	1	ug/L	0.	5/14/01	KW	MA VPH 97-12

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Aqueous Satisfacto	□ Soil		Other:	in this rep	oort upon laboratory rec	ceipt.	
Satisfact	ory 🗆 Bro						
1		ken 🗆 Leakii	ner				
ervative	DN/A E		ug.				
7	- N/A	pH≤2 □ pH>	2 □ pH ad	justed to	2 in lab Comment:		
☐ Received	on ice	Received cold	☐ Receive	d ambient	Recorded temper	rature: 5°C	
				nin this rep	port upon laboratory re	ceipt.	
1		ken D Leaki	ng				
	-			nent:	7.00		
			received in	Methanol	or air-tight container	m12 (athoral/a sail	
Soil or	□ Sample	s received in Mo	ethanol cover	ing soil	☐ not covering soil	ml Methanol/g soil I:1 +/- 25%	
Sediment	☐ Sample	received in air-	tight contains	er:	16	Other:	
□ Receive	d on ice	Received cold	□ Receive	d ambient	Recorded temper	rature: 5℃	
cant modificat C procedures for icant modificat nance/acceptar D surrogate recover in via GCMS using	ions made to allowed as re ions made to ace standards eries are listed a g all QC criteri uiry of those	the VPH metho quired by the EF the EPH metho for required QA s n/a, then that samp a specified in the me individuals imm	ed, as specified PH method? In the control of the c	Yesd in Section Yesd in Section The section Of the section GCMS using COMS using	No	the method.	
ed in this repor	rt is, to the b	est of my knowle	edge and beli Vali		te and complete.		
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# SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

#### Laboratory Report Supplement <u>References</u>

SW 846	Test Methods for Evaluating Solid Waste. Third edition, 1998
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act
40 CFR 141	National Primary Drinking Water Regulations
40 CFR 143	National Secondary Drinking Water Regulations
40 CFR 160	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Good Laboratory Practice Standards
APHA-AWWA-WPCF	Standard Methods for the Examination of Water and Wastewater. 19th edition, 1995
ASTM D 3328	Standard Methods for the Comparison of Waterborne Petroleum Oils by Gas Chromatography
EPA 540/G-87/003	Data Quality Objectives for Remediation Response Activities, Development Process
EPA 600/4-79-012	Quality Assurance Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-019	Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-020	Method for the Chemical Analysis of Water and Wastes
EPA 600/4-82-057	Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater
EPA 600/4-85/056	Choosing Cost-Effective QA/QC Programs for Chemical Analysis
EPA 600/4-88/039	Method for the Determination of Organic Compounds in Drinking Water
CT-ETPH	Analysis of Extractable Total Petroleum Hydrocarbons (ETPH)
MADEP EPH	Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)
MADEP VPH	Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)
QAMS 004/80	Guidelines and Specifications for Preparing Quality Assurance Program Plans, USEPA Office of Monitoring System and Quality Assurance
GC-D-52-77	Oil Spill Identification System

#### Acronyms & Abbreviations

B	AA	Atomic Absorption	MS	Matrix Spike
ı	ASTM	American Society for Testing and Materials	MSD	Matrix Spike Duplicate
	BOD	Biological Oxygen Demand	NTU	Nephelometric Turbidity Units
8	°C	degree(s) Celsius	PAHs	Polynuclear Aromatic Hydrocarbons
l	COD	Chemical Oxygen Demand	PCBs	Polychlorinated Biphenyls
	CMR.	Code of Massachusetts Regulations	PID	Photo Ionization Detector
	DEP	Department of Environmental Protection	PQL	Practical Quantitation Limit
ı	DI	De-ionized	R	Recovery (%R: Percent Recovery)
•	DO	Dissolved Oxygen	RSD	Relative Standard Deviation
	EPA	Environmental Protection Agency	SM	Standard Method
l	EPH	Extractable Petroleum Hydrocarbons	SR	Surrogate Recovery (%SR)
,	FID	Flame Ionization Detector	sw	Solid Waste
	GC	Gas Chromatograph	THM	Trihalomethane(s)
ı	GC/MS	Gas Chromatograph / Mass Spectrometer	TOC	Total Organic Carbon
,	ICP	Inductively Coupled Plasma	TOX	Total Organic Halogen
	Id	Identification	TPH	Total Petroleum Hydrocarbons
1	MCL	Maximum Contaminant Level	VOC	Volatile Organic Compound
	MDL	Minimum Detection Limit	VPH .	Volatile Petroleum Hydrocarbons



# CHAIN OF CUSTODY RECORD

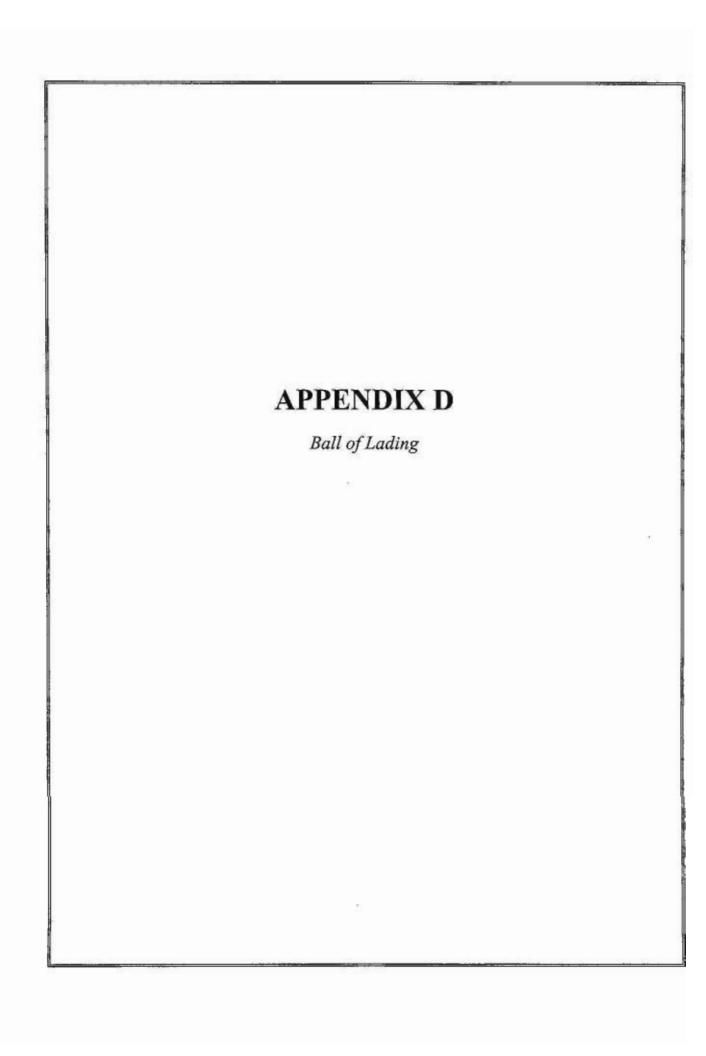
 All TATs subject to laboratory approval.
 Min. 24-hour notification needed for rushes.
 All samples are disposed of after 60 days. □ Standard TAT - 7 to 10 business days

KRush TAT - Date Needed: 5/16 Special Handling:

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	Feathring HANIBAL TRCHNOLOGY					Page	1	/ Jo						· All sam unless o	All samples are disposed of after 60 days unless otherwise instructed.	sed of af ucted.	ter 60 days
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			<u> </u> 			63					Loc	Location:	lited	Wed Springsella	Reld	S	State: MA
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11 Almgren Drive • Agadah, Massachusetts 01001 • 413-789-9018 • Fax 413-789-4076 • www.spectrum-analytical.com



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BWSC-012A

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BILL OF LADING (pursuant to 310 CMR 40.0030)

Release Tracking Number\*

L LOCATION OF SITE OR DISPOSAL SITE WHERE REMEDIATION	THATE HAS SEILERATED.
tele ase Name (optional):	
treet: 115 Wayside Avenue	
ity/Town: West Springfield	
to: 4/25/01 to: 4/25/01	
ddi ional Release Tracking Numbers Associated with this Bill of Lading:  * Note: If this Bill of Lading is the result of a Limited Removal Action (LRA)	The state of the s
B. PERSON CONDUCTING RESPONSE ACTION ASSOCIATED WI	TH BILL OF LADING:
lame of Organization: T Works Realty Group	GABÜ GABÜ
lame of Contact: Robert Townsend	Title: Owner
treet: 13 Southbridge Drive	( LOUR 2 ' AON
Street: 13 Southbridge Drive  City/Town: Agawam  Gelephone: (413) 789-7794 Ext:	State: MA ZIP Code: 01001
elephone: (413) 789-7794 Ext.:	OL EW. PROP
Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s.  Other Person:	
Other Person:  If an owner and/or operator is not conducting the response action ass contact person, address and telephone number, includ.  TRANSPORTER OR COMMON CARRIER INFORMATION:	ociated with the Bill of Lading, provide on an attachment the name, ing any area code and extension, for each, if known.
Other Person:  If an owner and/or operator is not conducting the response action ass contact person, address and telephone number, includ.  TRANSPORTER OR COMMON CARRIER INFORMATION:  Transporter/Common Carrier Name:  011 Recovery	ociated with the Bill of Lading, provide on an attachment the name, ing any area code and extension, for each, if known.
Other Person:  If an owner and/or operator is not conducting the response action ass contact person, address and telephone number, includ.  TRANSPORTER OR COMMON CARRIER INFORMATION:  Transporter/Common Carrier Name:  Oil Recovery  Contact Person:  John Gagnon	cociated with the Bill of Lading, provide on an attachment the name, ing any area code and extension, for each, if known.  Title: President
Other Person:  If an owner and/or operator is not conducting the response action ass contact person, address and telephone number, includ of the contact person of of the contact perso	cociated with the Bill of Lading, provide on an attachment the name, ing any area code and extension, for each, if known.  Title: President
Other Person:  If an owner and/or operator is not conducting the response action ass contact person, address and telephone number, includ  TRANSPORTER OR COMMON CARRIER INFORMATION:  Transporter/Common Carrier Name:  Oil Recovery  Contact Person:  John Gagnon  Street: 138 Palmer Avenue  City/Town: West Springfield	cociated with the Bill of Lading, provide on an attachment the name, ing any area code and extension, for each, if known.  Title: President  State: MA ZIP Code: 01089
Other Person:  If an owner and/or operator is not conducting the response action ass contact person, address and telephone number, included.  TRANSPORTER OR COMMON CARRIER INFORMATION:  Transporter/Common Carrier Name:  Oil Recovery  Contact Person:  John Gagnon  Street: 138 Palmer Avenue  City/Town: West Springfield  Telephone: (413) 737-2949  Ext.	cociated with the Bill of Lading, provide on an attachment the name, ing any area code and extension, for each, if known.  Title: President  State: MA ZIP Code: 01089
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Other Person:  If an owner and/or operator is not conducting the response action associated person, address and telephone number, included.  TRANSPORTER OR COMMON CARRIER INFORMATION:  Transporter/Common Carrier Name:  Oil Recovery  Contact Person:  John Gagnon  Street:  138 Palmer Avenue  City/Town:  West Springfield  Selephone:  (413) 737-2949  Ext:  Seperator/Facility Name:  Ondricks Construction  Confact Person:  Paul Mullen  Street:  58 Industry Road  City/Town:  Chicopee  Selephone:  (413) 592-2081  Ext:  Type of Facility:  X Asphalt Batch/Cold Mix  Landfill/Disposal Check one)  Asphalt Batch/Hot Mix  Landfill/Daily Cov  Thermal Processing  Landfill/Structural	coclated with the Bill of Lading, provide on an attachment the name, ing any area code and extension, for each, if known.  Title: President  State: MA ZIP Code: 01089  Title: Contact  State: MA ZIP Code: 01020  Incinerator Temporary Storage  or Other:
Other Person:	cociated with the Bill of Lading, provide on an attachment the name, ing any area code and extension, for each, if known.  Title: President  State: MA ZIP Code: 01089  Title: Contact  State: MA ZIP Code: 01020  Incinerator Temporary Storage  or Other: WV4135922081

#### Massachusetts Department of Environmental Protection

Bureau of Waste Site Cleanup

BWSC-012A

411

Release Tracking Number

#### BILL OF LADING (pursuant to 310 CMR 40,0030)

E DECEMBE FACILITY TEMPODARY STORAGE LOCATION (contin	und) .	
E. RECEIVING FACILITY/TEMPORARY STORAGE LOCATION (contin Temporary Storage Address:	uea);	
Street:	****	
City/Town:	State:	ZIP Code:
F. DESCRIPTION OF REMEDIATION WASTE: (check all that apply)	2500	
X Contaminated Media (check all that apply): (X) Soil () Gr	oundwater O Sur	rface Water Other:
		) Demolition/Construction Waste
Non-hazardous Uncontainerized Waste (check all that apply): Nor	n-aqueous Phase Liqu	uid Other:
	k Bottoms/Sludges (	_
	t Fuel #2 Oil	#4 Oil #6 Oil Waste Oil
Estimated Volume of Materials: Cubic Yards:	:	Other:
Contaminant Source (check one/specify): Transportation Accident		QL 12-0750 10 10000 1000 10000
Response Action Associated with Bill of Lading (check one): X Immediate	e Response Action	Refease Abatement Measure
Utility-Related Abatement Measure Limited Removal Action	Comprehensive R	Response Action Other
If supporting documentation is not appended, provide an atta document such information was pre		
G. LICENSED SITE PROFESSIONAL (LSP) OPINION:		
Name of Organization: SEE ATTACHED		70.00
	le:	
Telephone: Ext.:		
I attest under the pains and penalties of perjury that I have personally examin accompanying this submittal. In my professional opinion and judgment based		
(i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and (iii) the provisions of 309 CMR 4.03(5),		
to the best of my knowledge, information and belief, the assessment actions usubject of this submittal for acceptance at the facility identified in this submittated facility is permitted to accept Remediation Waste having the characteristics distributed including, but not limited to, possible fines and imprisonment, if I submit information.	al comply with the app scribed in this submit	plicable provisions of 310 CMR 40.0000, and such ttal. I am aware that significant penalties may result,
LSP Signature:	Seal:	
Date:		
License Number:		
200 V S		



#### Massachusetts Department of Environmental Protection

BWSC-012A

411

Bureau of Waste Site Cleanup

Release Tracking Number\*

1 - 13697

H. CERTIFICATION OF PERSON CONDUCTING RESPONSE ACTION ASSOCIATED WITH THIS BILL OF LADING:

BILL OF LADING (pursuant to 310 CMR 40.0030)

I certify under penalties of law that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained herein is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penulties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

Sigrature:	Kohnt Honnens	Date: 4-27-01
Name of Person (prin	Robert Townsend	

Bureau of Waste Site Cleanup	vironmental Protection	BWSC-012B 411
BILL OF LADING (pursuant to 310 CMR	40.0030)	Release Tracking Number
DEP SUMMARY SHEET OF	4	1 - 13697
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e of Shipment:  Time of Shipment:  7.5  AM PM  cl-/Tractor Registration: Trailer Registration (if any):	♥ : [ [ [ [ ] ] ] [ ] [ ] [ ] [ ] [ ] [ ]	f Réceipt: 7:55↑ ☑ AM ☐ Ph
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e of Shipment:  4-30-0/ 1:15  AM. PM		FReceipt: 7:56 SAM PA
clvTractor Registration: Trailer Registration (if any):	Load Size (cu. yds. (Ons))	15.31 TON
ad 3: Signatiuse of Tradsporter Representative:	Receiving Facility/Temporary Storage R	epresentative:
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Pad 4: Signatiure of Transporter Representative:	Receiving Facility/Temporary Storage Re	epresentative:
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U-30-01 Sold AM □ PM □ PM □ Ck/Tractor Registration: Trailer Registration (if any):		7.25 JAM [P
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BWSC-012B

Release Tracking Humber:

BILL OF LADING (pursuant to 310 CMR 40,0030)

1-13697

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ate of Shipment:  Time of Shipment:  (circle one anypm uck/Tractor Registration:  Trailer Registration (if any):	Date of Receipt: Time of Receipt: 9:07 (circle one) am/pm
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LOAD 5: Vignature Transporer Representative:	Recaiving Facility/Temporary Storage Representati
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LOAD A Sgrafty & A Transporter Representative:	Receiving Facility/Temporary Storage Representati
Cate of Shipment: Time of Shipment:	Data of Receipt: Time of Receipt: 4/38/01 // :26
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Revised 10/1/94

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BWSC-012B

Resease Tracking Humber:

BILL OF LADING (pursuant to 310 CMR 40,0020)

200 OF 9	
LOAD INFORMATION: LOAD 1: Signature Of Transport Representative:	Receiving Facility/Temporary Storage Representative:
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LOAD 2: Signature of Transporter Representative:	Receiving Facility/Temporary Storage Representative:
Date of Shipment: Time of Shipment:	Date of Receipt: Time of Receipt:
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LOADA: A Signature of Transporter Representative:	Receiving Facility/Temporary Storage Representative:
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-42481	Load Size (cu. ydertons) 16.63 TUN
LOAD, 72 Signature of Transporter Representative;	Receiving Facility/Temporary Storage Representative:
Date of Shipment: Time of Shipment	Date of Receipt: Time of Receipt:
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AD 1: Signalure of The Corner Hagresentative:	Receiving Facility/Temporary Storage Representative:
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DAD 5: Signature of Transporter Representative:  ate of Shipment: Time of Shipment: /	Receiving Facility/Temporary Storage Representative:  Date of Receipt: Time of Receipt:  (circle one) amporations and Size (cu. yds 2019)
OAD 6: Signature of Transporter Representative:  late of Shipment: Time of Shipment:	Peceiving Facility/Temporary Storage Representative:  Date of Receipt: Time of Receipt.  (circle one) ampa
OAD 7: Signature of Transporter Representative:  Date of Shipment: Time of Shipment: (circle one) am/pm ,  nuck/Tractor Registration: Trailer Registration (if any):	Receiving Facility/Temporary Storage Representative:  Date of Receipt: Time of Receipt.  (circle one) amount

Total Carried Forward and This Page(cu.yds.gons): 428.28 TM

BWSC-012C

411

BILL OF LADING (pursuant to 310 CMR 40.0030)

Release	Tracking	Number

SUMMARY SHEET \_\_\_\_ ( \_\_\_ OF \_\_ / - 13697 K. SUMMARY OF SHIPMENTS: Daily Volume Shipped Number of Loads Shipped: (cu. yds./tons); Date of Receipt: Date of Shipment: 4-30-01 4-30-01 24 428.28 tons 24 428.28 tons Summary Sheet Total Shipped: Bill of Lading Total Shipped (only if different):

BWSC-012C

411

BILL OF LADING (pursuant to 310 CMR 40.0030

Release Tracking Number

ACKNOWLEDGMENT OF SHIPMENT AND RECEIPT OF REMEDIATION WASTE BY PERSON CONDUCTING RESPONSE ACTION ASSOCIATED WITH THIS BILL OF LADING:  If y under penalties of law that I have personally examined and am familiar with the information contained in this submittal, including any and all uments accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the ential information contained in herein is, to the best of my knowledge and belief, true, accurate and complete, I am aware that there are significant alties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.	DEP	SUMMARY SHEET		1	- 13697
Paul Mullen Title: Contact Person  Date: 5/2/01  ACKNOWLEDGMENT OF SHIPMENT AND RECEIPT OF REMEDIATION WASTE BY PERSON CONDUCTING RESPONSE ACTION ASSOCIATED WITH THIS BILL OF LADING:  Itify under penalties of law that I have personally examined and am familiar with the information contained in this submittal, including any and all uments accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the relation contained in herein is, to the best of my knowledge and belief, true, accurate and complete, I am aware that there are significant at lettes, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.  Date: 4-27-01					7.00
Paul Mullen  Date: Slalo I  ACKNOWLEDGMENT OF SHIPMENT AND RECEIPT OF REMEDIATION WASTE BY PERSON CONDUCTING RESPONSE ACTION ASSOCIATED WITH THIS BILL OF LADING:  Tify under penalties of law that I have personally examined and am familiar with the information contained in this submittal, including any and all uments accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the erial information contained in herein is, to the best of my knowledge and belief, true, accurate and complete, I am aware that there are significant elities, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.  Date: 4-27-01			ON WASTE AT RECEIVING FA	CILITY OR TEMPORAL	RY STORAGE:
ACKNOWLEDGMENT OF SHIPMENT AND RECEIPT OF REMEDIATION WASTE BY PERSON CONDUCTING RESPONSE ACTION ASSOCIATED WITH THIS BILL OF LADING:  If y under penalties of law that I have personally examined and am familiar with the information contained in this submittal, including any and all unents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the real information contained in herein is, to the best of my knowledge and belief, true, accurate and complete, I am aware that there are significant elities, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.  Date: 4-27-01	celving Facility/Te	emporary Storage Representative (print):			
ACKNOWLEDGMENT OF SHIPMENT AND RECEIPT OF REMEDIATION WASTE BY PERSON CONDUCTING RESPONSE ACTION ASSOCIATED WITH THIS BILL OF LADING:  Itify under penalties of law that I have personally examined and am familiar with the information contained in this submittal, including any and all unments accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the erial information contained in herein is, to the best of my knowledge and belief, true, accurate and complete, I am aware that there are significant at elties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.  Date: 4-27-01		Paul Mullen	Title: _		son
CONDUCTING RESPONSE ACTION ASSOCIATED WITH THIS BILL OF LADING:  tify under penalties of law that I have personally examined and am familiar with the information contained in this submittal, including any and all uments accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the crial information contained in herein is, to the best of my knowledge and belief, true, accurate and complete, I am aware that there are significant elties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.  Date: 4-27-01	gnature:	62 x mil	Date: _	5/2/01	9
tify under penalties of law that I have personally examined and am familiar with the information contained in this submittal, including any and all uments accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the crial information contained in herein is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant attention, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.  Date: 4-27-01				Y PERSON	-
01 + 7 - 0	erlify under penals cuments accompa aterial information	ties of law that I have personally examined and anying this certification, and that, based on my contained in herein is, to the best of my knowle	am familiar with the information contai inquiry of those individuals immediate adge and belief, true, accurate and con	ly responsible for obtaining to relete, I am aware that ther	he information, the e are significant
ne of Person (print):Robert Townsend	mature:	Kolut Formens	Date	4-27-01	The siles
ne of Person (print):		2	1		
	me of Person (pr	int): Kobert lownsens	<u>/</u>		
		40	G-		

#### Use LSP Replacement Opinion V with the following BWSC Form:

Bill of Lading (BWSC-012A)

#### LSP Replacement Opinion V

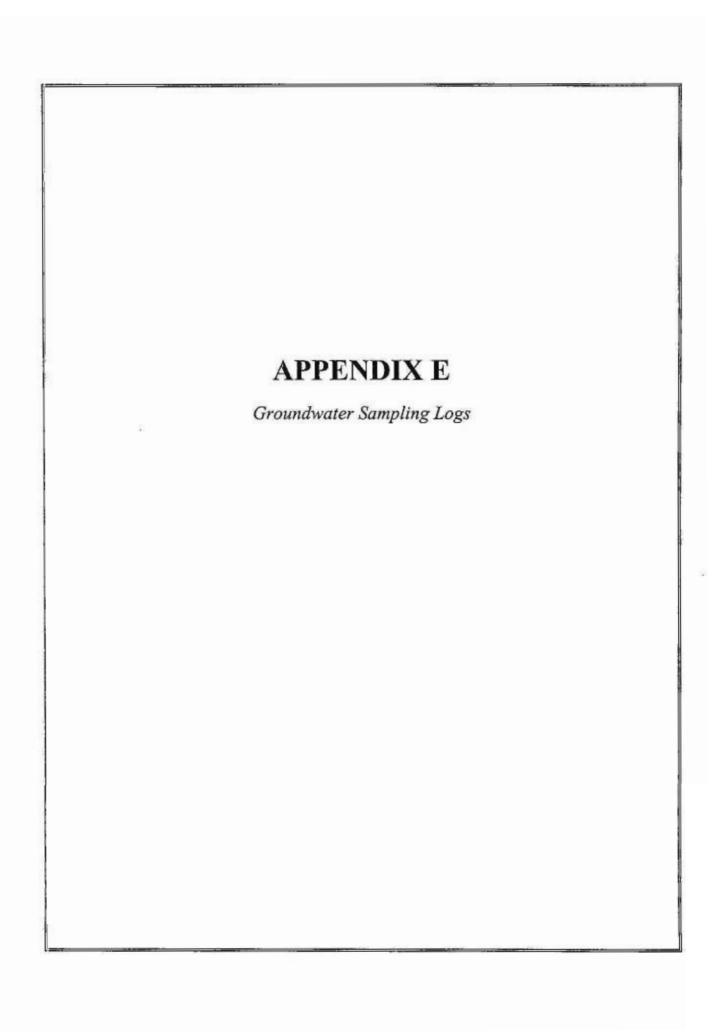
I attest under the pains and penalties of perjury that I have personally examined and am familiar with this submittal, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of

- (i) the standard of care in 309 CMR 4.02(1),
- (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and
- (ii) the provisions of 309 CMR 4.03(5),

to the best of my knowledge, information and belief, the assessment actions undertaken to characterize the Remediation Waste which is (are) the subject of this submittal for acceptance at the facility identified in this submittal comply with the applicable provisions of 310 CMR 40,0000, and such facility is permitted to accept Remediation Waste having the characteristics described in this submittal. I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

Release Tracking Number: 1 - 13697			
LSP Name: Kevin C. Sheehan		Title: Princip	oal .
LSP Organization: Environmental Compliance	e Services, Inc.	Date: 4 12-1	101
Telephone/Ext. 413 789 3530		Seal:	MEVIN CE
		4	SHEEMAN ST
			SITE PROPERTY

\$2/23/23





#### Fush manuful Compllance Services, Inc.

588 Silver Street, Agawam, Massachusetts 0 IUU I MA: (413) 789-3530 FAX: (413) 789-2776

#### LOW-FLOW GROUNDWATER SAMPLING LOG

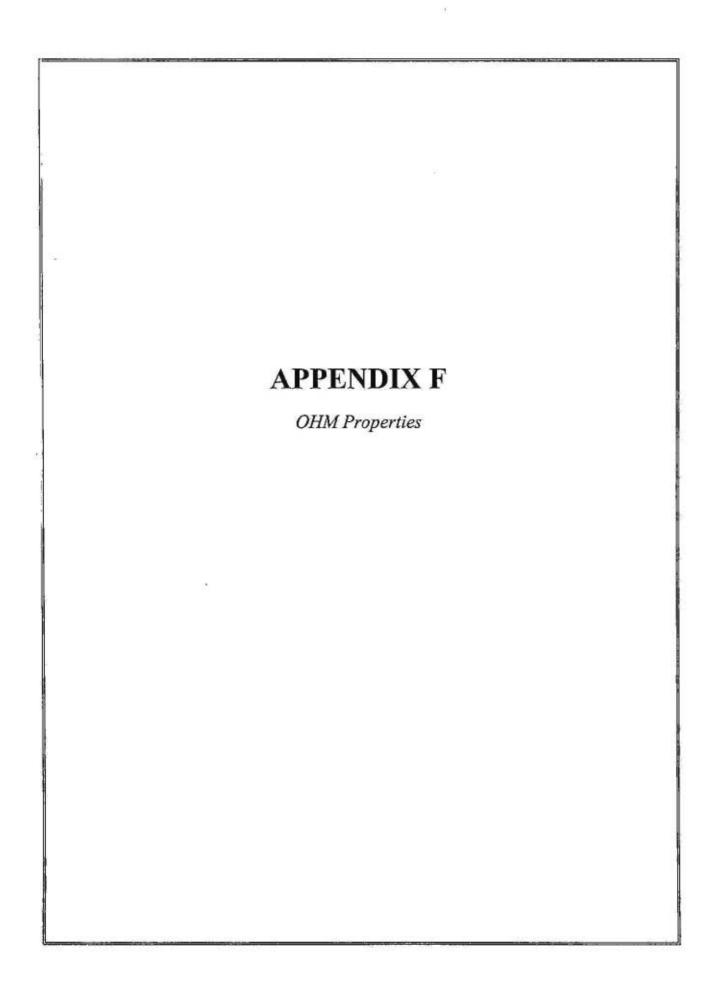
Client:						Taribra.		Job Numbe	r:	13	997			WELL I.D.
Location	:115	Ward	ide /	tuc W.	Sofla.	MA		Date:	5/9	101	10 th			MW-2
Personn	el 5,	Paris	×					Weather Co	nditions:	50	997 my	800.	f.	1110 -
		TEM.	/		T 40		15. 4	1 5						
Volume Purped	Sample	Degrees	pH	Specific Conductivity	Dissolved Oxygen	millvolts	Orawdown <0.3 feet		Depth of Well	Standing	Middle of Saturated	Static Volume	Minimum Purge Volume	Observations
(gations)	(minutes)	12.85 (33)		(uS/cm)	(mg/L)			PVC/RIM	PVC/RIM	(feet)	Zone (feet)	(gallons)	(gations)	
	Dia, Casing					Name of the last		12,29	25.61			V/ U.V. 12		200
CELL	2.0	10,77	6.38	0.331	6.49	469	3	(4)	(4)				19	
	4.0	15.62	639	0.331	5.95	472		500			AND THE PROPERTY OF THE	95		
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	12.0	10,05	6.44	0,320	5,64	745				-	-	LIGHT.		
	17.0	10140	6.44	0.326	5,40	475		-	-	-				
	16.0	10.30	6/38	6,326	5,53	475							-	
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	220	10.16	6.39	0.321	5.67	476							22	
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# Fredhammental Controllation Services, his 588 Silver Street, Agawam, Massachusetts 0 100 t MA: (413) 789-3530 FAX: (413) 789-2776

### LOW-FLOW GROUNDWATER SAMPLING LOG

	1	- 6		le Ave		-			_		ny 8			
olume	Sample	TEMP.	pН	Specific	Dissolved	mV	< 0.3 feet	Depth to Water	Oepth of Well	Standing	Middle of Saturated	Static Volume	Minimum Purpe Volume	Observation
irged itions)	Time (minutes)	(Celsius)		Conductivity (uS/cm)	Oxygen (mg/L)	mayors	-0.5 leet	PVC/RIM	PVC/RIM	(feet)	Zone (feet)	(gallons)	(gations)	Cuscivado
	ia.Casing					-		13.26	28.89					
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-	120	12,70	6.00	0,547	6145	763				_	-			
	14.0	12.40	6.00	0,522	8.07	765			-					
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# PROPERTIES OF CONTAMINANTS

	CAS	MEAC	Southerry	dA	HC	Density	NO.	\$	2	ž	10	Rfd	Transformation Products
C5-C8 aliphatics	VPH	.94.6	1.10E+01	1.00E-01 5.40E+01	5.40E+01	93	ND	ON	-0.24	2265	N-P	6.00E-01	6.00E-01 None Known
C9-C12 aliphatics	VPH	6.98	7.00E-02	8.70E-04	6.50E+01	149	QN	QN	0.26	1.5 X 10 <sup>5</sup>	N-P	6.00E+00	6,00E+00 peroxyactye nitrate, methyl nitrate
C9-C10 aromatics	VPH	8.8	5.10E+01	2.90E-03	3.30E-01	120	QN	QN	1.76	1778	N-P	3,00E-03	ethylene, bromide ions, ethylene glycol
		8										1	
Volatile Aromatics									1000		10000	255	
penzene	71-43-2	5.5	1.78E+03	7.60E+01	5.43E-03	8765	.6468	7379	2.13	1.81	N-P.D	5.00E-03	5.00E-03 cis-benzene glycol
toluene	108-88-3	-95.1	5,15E+02 2,20E+01	2.20E+01	6.61E-03	8998	.58	699	2.73	2.41	N-P.D	2.00E-01	cis-2,3-dihydroxyl-1-methylcyclohexa-1,4-diene
ethylbenzene	100-41-4	-94.97	1.52E+02 7,00E+00	7,00E+00	7.90E-03	798.	878	782	3.15	2.83	D.A		
m-xylene	108-38-3	-50	2.00E+02 8.00E+00	9.00E+00	6.91E-03	.8642	808	717.	3.2	2.84	N-P	2.00E+00	3-methyl-benzyl alcohol
o-xylene	95-47-6	-25	1,70E+02	7.00E+00	4.94E-03	88	.802	.932	3.12	2.84	N-P	2.00E+00	2.00E+00 No data found
p-xylene	106-42-3	13	1.98E+02 9.00E+00	9.00E+00	7.01E-03	.861	.635	.753	3.15	2.84	N-P	2.00E+00	4-methylbenzi alcohol
						1							
C9-C18 aliphatics	ЕРН	.94.6	1,00E-02	1,40E-04	6.90E+01	170.	QN	S	-0.24	6.8 x 105	d-Z	6.00E-01	6.00E-01 None Known
C19-C36 aliphatics	ЕРН	6.98	NA	NA	NA	NA	QN	Q	0.26	AN	d-N	6.00E+00	peroxyactye nitrate, methyl nitrate
C11-C22 aromatics	EPH	8.8	5.80E+00 3.20E-05	3.20E-05	3.00E-02	150.	QN	QN	1.76	2000	N.P	3.00E-03	3.00E-03 ethylene, bromide ions, ethylene glycol
Semi-Volatilles naphthalene	91-20-3	80.2	3.10E+01	2,18E+02	1,27E-03	1.162	¥	¥	3.3	3.11	٥	4.00E-02	4.00E-02 1-naphthol, cis-1,2-dihydroxyl-1,2-dihydronaphthalene
Non-Halogenated Semi-Volatiles						ı	T		Ī	1			
acenaphthene	83-32-9	92.5	3.88E+00*	2,79E+02	1.46E+01	1.225	NA	N.	3.92	3.7	۵	S	No data found
anthracene	120-12-7	216.3	7.5E-02*	3.40E+02	1.40E+02	1.25	×	NA	4.45	4.1	4	Q	No data found
fluoranthene	206-44-0	107	2.65E-01*	1.00E-02	8.50E-06	1.252	×	¥.	4.9	4.58	AN	4.00E-02	No data found
fluorene	86-73-7	116.7	1.90E+00*	2.98E+02	2.10E+01	1.203	¥	¥	4.18	3.9	A	Q	No data found
2-methylnaphthalene	91-57-6	34.58	2.54E+01* 6.80E-02*	3.80E-02*	5.06E-02*	1.0058	NA	¥	3.86	3.93	Q	4.00E-02	No data found
phenanthrene	85-01-8	100	1.18E+00	2.01E-04*	3.98E-05*	86	NA	×	4.46	4.1	٥	4.00E-02	catechol
pyrene	129-00-0	150	1.48E-01*	6.67E-06*	1.20E-05*	1.271	NA	NA	4.88	4.58	N'O	QN	No data found
Notes:	VP = vapor point	point	HC = Henry's Constant	s Constant		= density	-	DV=dynamic viscosity	viscosity		MP = melting point	ng point	
	KV = kinematic viscosity	rtic viscosi			_	low = Octan	ol/Water Po	Kow = Octanol/Water Partition Coefficient (log)	ficient (log)		Coc = Orga	nic Carbon	Koc = Organic Carbon Partition Coefficient (log)
	B = biodegradation potential	idation pot		ifd = Chron	ege	ance dose		Values at 2	0°C unless	'Values at 20° C unless otherwise noted	oted		
The second secon	NA = not applicable	olicaable		ö	a found n	Neg = Negligible	ible					30000	
Biodegradation Notes:	P = persistent N-P = non persistent Arsignificant degradation B = slow to moderate activity attending significant volatilization rate N = not significantly degraded-precluded by extensive vaoibilization rate	noderate a ficantly de	N-P= non persistent ctivity attending signitated praded-precluded by	rsistent , ng significa rded by ext	A=significant degradation with gradual adaption ant volabilization rate  D = significant tensive vacibilization rate  T=significant	degradabor on rate Ization rate	with grad	ial adaption significa significant	nt degradat degradatio	uai adaption. D ≈ significant degradation with rapid adaption. T-significant degradation with gradual adaption.	d adaption		
Source	ISEPA Subsurface Remediation Guidance EPA/540/2,90/01th 1991	Surface Re	mediation G	idance Ef	A/540/2-90/	1116 1001							
200	Montgomery, John H. Groundwater Chemicals Desk Reference, Lewis Publishers, Inc. 1990	John H. C	iroundwater	Chemicals	Desk Refere	noe. Lewis I	Publishers,	Inc. 1990					
	Massachusetts Contingency Plan 310 CMR 40.000	tts Conting	ency Plan 3'	0 CMR 40	000								
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# PROPERTIES OF CONTAMINANTS

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	CAS	MP/C	MP/C Solubility	dA	HC	Density	NO	×	7	ž	8	Rid	Transformation Products
Volatile Organic Compounds Tetrachloroethene	127-18-4	-19		1.50E+02 1.40E+01 1.53E-02	1.535.02	6.78	QN	ON	2.6	2.42	Z	1.00E-02	1.00E-02 TCE, cis-1.2-dichloroethylene, trans-1.2-dichloroethylene, vinyl chloride
Trichloroethene	79-01-6	-73	1,10E+03	1.10E+03 5.40E+00 9.10E-03	9,105-03	1.4642	QN	ON	2.53	1.81	N	2.00E-03	2.00E-03   ols-1,2-dichloroethytene, trans-1,2-dichloroethytene, viryl chloride
1,1-dichloroethane	75-34-3	-97.4	5.50€+03	5.50E+03 1.82E+02 4.30E-03	4.30E-03	4.04	QN	QN	1.78	1.48	N	1.00E-01	1,00E-01 kinyl Chloride
trans-1,2-dichloroethylene	150-60-5	.50	6.00E+02	6.00E+02 2.65E+02; 3.84E-01	3.84E-01	1,2565	ON	QN	2.08	1.77	Z	2.00E-02	2.00E-02 vinyl Chloride
cis-1,2-dichloroethene	156-59-2	-80.5	3,50E-01	3,50E-01 2,40E+01	QN	1.2837	QN	QN	1.86	QN	N	1.00E-02 ND	QN
1,1-Dichloroethens	75-35-4	-122.1	4.00E+02	4,00E+02 4,95E+02 2,10E-02	2.105-02	1.218	QN	QN	2.13	1.81	z	9.00E-03	9.00E-03 1,1-dichloroethylene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, vinyl chloride
1,1,1-trichionosthane	71-55-6	-30,4	4.40E+03	4.40E+03 1.00E+02 1.50E-02	1.50E-02	120	QN	QN	1.76	1778	Z	9.00E-02	9.00E-02 ethylene, bromide ions, ethylene glycol
Notes:	VP = vapor point HC = KV = kinematic viscosity B = biodegradation potential NA = not applicable	point natic viscos radation po splicasble	HC ≈ Henri sity stential	HC = Henry's Constant D = density  Kow = Oct  Ry  tential Rid = Chronic Oral reference dos  ND = No data found Neg = Neg	ic Oral refe ta found	/s Constant D = density DV=dynamic viscosity Kow = Octanol/Water Partition Coefficient (log) Rid = Chronic Oral reference dose 'Values at 20' C unless ND = No data found Neg = Negligible	Vater f	DV=6ynamic viscosity MP = garlison Coefficient (log) Koc = Vatues at 20° C unless otherwise noted	Ticlent (log)	otherwise	MP = melting point Koc = Organic Car noted	g point iic Carbon	MP = melting point Koc = Organic Carbon Partition Coefficient (log) noted
Biodegradation Notes:	P = persistent B = slow to mo N = not signific	ent moderate vificantly de	N-P= non   sclivity atter egraded-pre	P = persistent N-P= non persistent A=significant degrada B = slow to moderate sclivity attending significant volatization rate N = not significantly degraded-precluded by extensive yolatilization	Amaignifican sant volatifizan etensive vol.	it degradation sation rate stitzation rate	with gra	tion with gradual adaption  D = significant degradation with rapid adaption rate T=significant degradation with gradual adaption	nt degradation degradation	ion with rap	id adaption ual adaptio		
Sources	USEPA Su Montgomer Massachus Massachus	bsurface F y, John H. etts Contin	demediation Groundwah Igency Plan Documentali	USEPA Subsurface Remediation Guidance. EPA/340/2-90/011b. 1991 Montigomery, John H. Groundwater Chemicals Desk Reference, Lewis Publishers, Inc. 1990 Massachusette Confingency Plan 310 CMR 40.0000 Massachusette Dep Documentation for the Risk Assessment Short Form, October 1992	PA/540/2-5 s Desk Refn 0,0000 sk Assessm	iovottib, 1991 irence, Lewis nent Short Fo	n s Publisher orm, Octob	s, Inc. 1990 er 1992	2000				